The Magazine of

STANDARDS

The Magazine of
STANDARDS
Formerly Standardization

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MARGINAL NOTES

The August Issue

The August issue of *The Magazine of Standards* will be devoted to the Golden Jubilee of the International Electrotechnical Commission, which will be celebrated in Philadelphia September 1-16. The issue will cover the history of the IEC, show how standardization has contributed to the development of electrical science and the electrical industry, and trace the role played in this development by such organizations as the National Electrical Manufacturers Association, the American Institute of Electrical Engineers, the Edison Electrical Institute, the American Society of Mechanical Engineers, the Illuminating Engineers Society, the Institute of Radio Engineers, the Radio Electronic Television Manufacturers Association, the Telephone Group, and the National Bureau of Standards. In addition we hope to include a look into the future in this field.

This Month's Cover

The reinforced concrete framework shown here is that of the George Washington Housing Development in Manhattan, a Federal project being built under the auspices of the New York City Housing Authority (photo by Lou Marinoff). The New York City Housing Authority has become the largest builder of residential units in the United States, Samuel P. Kaidanovsky points out in an article (page 186) which describes the development and operation of the Authority's standard program for materials and equipment. It has been found that this standardization program promotes efficient operation,

ASA
Reg. U. S. Pat. Off.

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Opinions expressed by authors in THE MAGAZINE OF STANDARDS *are not necessarily those of the American Standards Association.*

facilitates the management of the projects, and saves the city money.

Development of building regulations which have guided the construction of such residential units as the George Washington Project are among the accomplishments of the American Concrete Institute, whose growth during the past fifty years is commemorated in this issue (page 172). Fifty years ago the cement industry was chiefly preoccupied with concrete blocks and sidewalks. Today concrete is used for highways, bridges, huge dams, and low-cost housing. One of ACI's important contributions to this advance was the promotion of standards in this field. In addition to its Building Code, which has been approved as American Standard A89.1-1951, the Institute has developed standards relating to concrete pavements and bases, application of portland cement paints to concrete surfaces, winter concreting methods, precast concrete floor units, farm silos, concrete mix design, cast stone, metal supports for reinforcement, and measuring, mixing, and placing concrete.

Correction

In the monthly feature, Government Standards, in the May issue, an error was made in the legend to the table which compared the requirements of State Safety Codes for Abrasive Wheels with American Safety Code for the Use, Care, and Protection of Abrasive Wheels, B7.1-1947. Please see page 196 of this issue for the corrected legend.

Standards on Alternating-Current Power Circuit Breakers Revised

With the publication of four revised standards, ASA's Sectional Committee on Power Switchgear, C37, and its Subcommittee on Power Circuit Breakers have brought up-to-date the American Standards on Alternating-Current Power Circuit Breakers. Mr Cox, Chairman of Sectional Committee C37 outlines the new material included in these standards and also points out the possibilities of even greater improvements envisioned by designers, manufacturers, and educational and research institutions (page 184).

This Month's STANDARDS PERSONALITY

This month's "Personality" featuring Dr Loyd Jones was ready for publication when ASA received word that Dr Jones died suddenly, May 15. It is published here as originally prepared in grateful memory of Dr Jones' contributions to standardization.

Dr Loyd A. Jones, recently retired from his duties with the Eastman Kodak Company, where he had been head of the Physics Division of the Research Laboratories, has had 42 years of outstanding accomplishment to his credit. In those 42 years, he contributed in great measure to man's knowledge of the physics of photography.

Although a scientist of the highest caliber, Dr Jones has not been content to sit behind closed laboratory doors and work out abstruse theories. Instead, he has brought his knowledge to the public. As chairman of the first committee on standardization of photographic materials, processes, and equipment (Sectional Committee Z38), he had an outstanding role in making photographic materials and processes more readily usable by the man in the street. Dr Jones was chairman of Z38 for 11 years, until the work had grown to the point where it was necessary to divide it among four committees. During that time, Dr Jones's research was largely responsible for development of the American Standards on photographic sensitometry that have made it possible to calibrate film, cameras, and exposure meters in terms of the world-recognized "ASA Exposure Index."

For this, and other work, Dr Jones received some of the outstanding awards in the photographic field. He was awarded the annual progress medal by the Society of Motion Picture Engineers (now the Society of Motion Picture and Television Engineers) in 1939. In 1943, he was awarded the Frederick Ives Medal of the Optical Society of America. The Royal Photographic Society of Great Britain honored Dr Jones with its 1948 Progress Medal for his contributions to the use of photographic sensitometry in the manufacture and control of photographic materials. In 1950, he was awarded the Progress Medal of the Photographic Society of America for "outstanding contributions to photographic science and practice" that "have benefited all photographers."

Dr Jones was born in Nebraska in 1884 and was graduated from the University of Nebraska with a B.S. in Electrical Engineering in 1908. He worked as an assistant in physics at the University until he received his Masters degree in 1910. In 1933 he was given an honorary degree of Doctor of Science by the University of Rochester.

From the University of Nebraska he went to the National Bureau of Standards as a laboratory assistant in physics. In 1912 he joined the Eastman Kodak Company as assistant physicist in the Research Laboratory and became chief physicist in 1916.

At a luncheon given in his honor in New York in 1950, Major General John Hilldring, USA (retired), General Manager of Foreign Operations for the General Aniline & Film Company, commented on Dr Jones's career. "What a predicament the camera user must have been in before the work of Committee Z38," he said. "When Dr Jones and his committee went to work, it was in such a wilderness that everyone who produced photographic equipment set his own standards, to the everlasting confusion of everyone who used photographic materials." And Allen Stimson, Photometric Engineering Section, General Electric Company, told how Dr Jones, bringing his scientific knowledge and understanding of problems to the committee room, was the "moving spirit" back of the work of Sectional Committee Z38. "In many cases, agreement on standards was difficult and required sacrifices on the part of the members," he declared. "Dr Jones has been a most able chairman in coordinating this varied group."

From SIDEWALKS—

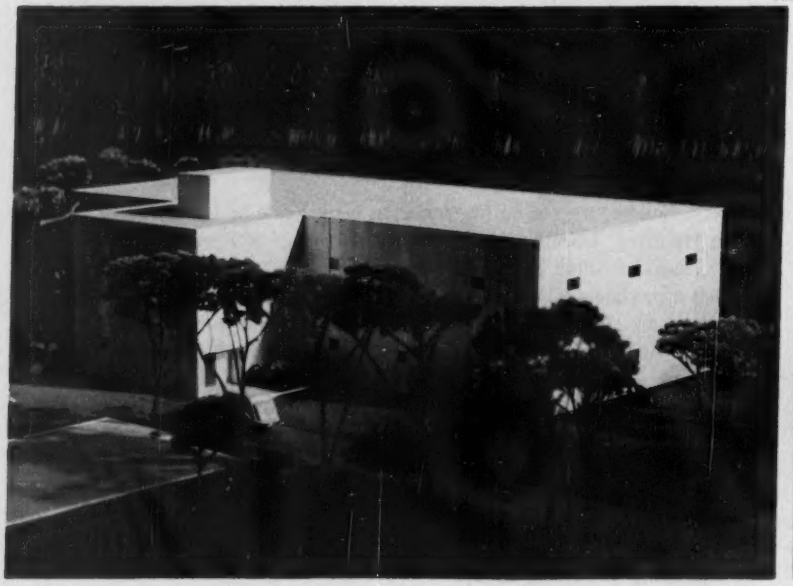
Bettman Archive

New York Historical Society

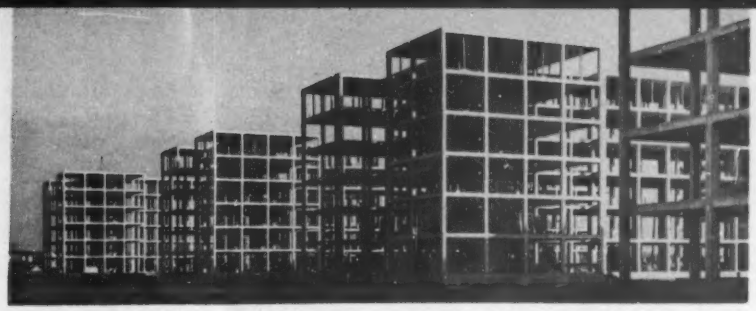
Concrete Institute

Contrasts, 50 years ago and today — *Grand Central Terminal (left) in the main unchanged but surroundings and traffic are unrecognizable. Plans for Michigan Bell Telephone Company Southfield (Detroit) office (below) call for reinforced concrete 13 in. thick to resist A-bomb blasts. First and second floors as well as roof are of two-way reinforced concrete slabs supported on reinforced concrete girders. 1905 building, located in Dallas, Texas, (center) was of hollow block concrete. New York City's Lillian Wald housing development (below, right) uses reinforced concrete base.*

Photo at left and below courtesy American Concrete Institute



to HOUSING



Lou Marinoff, N.Y.C. Housing Authority

Celebrates 50 Years Growth

by WILLIAM A. MAPLES

TODAY'S use of concrete in graceful arches and shells and in precast and prestressed members is everyday evidence of the advance from the concrete blocks and sidewalks which preoccupied this industry 50 years ago. During the intervening half-century, the American Concrete Institute has made its influence felt in research for better products, in standard specifications and test methods to assure satisfactory service, and in building regulations which have guided the construction of concrete bridges, super-highways, office and factory buildings, and residential units.

Many events of national, and even worldwide, importance have influenced these developments. The growth of automobile traffic has changed the dirt roads of 1904 into the expressways of today. Disastrous fires, such as the San Francisco earthquake and fire in 1910, led to tests of reinforced concrete structures, and to changes in building codes to permit their use. World War I encouraged the use of concrete to conserve scarce iron and steel even to the point of using concrete ships. The 'thirties were the era of huge dams; the 'forties of low cost housing; and in the 'fifties the trend is toward lower construction cost through development of precast and prestressed concrete structures.

A serious lack of standard practice in making concrete block early in the century led to efforts in 1904 to organize a society to bring order from the chaos in this industry. Original plans were to form an association of manufacturers of concrete block machines to educate users of the machines to make good block. The scope of the organization was extended, however, to cover the various uses of cements to bring about a better knowledge of the art in general.

Lou Marinoff, N.Y.C. Housing Authority

This preliminary work resulted in the organization of the National Association of Cement Users in January, 1905.

Purpose of the society was: "To disseminate information and experience upon, and to promote the best methods to be employed in, the various uses of cement, by means of conventions, the reading and discussion of papers upon materials of a cement nature and their uses, by social and friendly intercourse at such conventions, exhibitions, and study of materials, machinery, and methods, and to circulate among its members, by means of publications, the information thus obtained."

Technical papers at that time indicated a predominant interest in sidewalks and concrete products. In 1907, the first fruits of committee efforts were realized in the report of the committee on sidewalks, streets, and floors. This report, later adopted as a standard specification, established thicknesses for top and bottom coats, size of block, concrete materials, and mix proportions. Interesting are the detailed directions for hand mixing and the absence of provisions for curing the finished concrete.

At the 1907 meeting of the Association the committee on testing of cement and cement products gave an interesting summary of the then existing work of other societies and of the Joint Committee, made up of representatives of the American Society for Testing Materials, American Society of Civil Engineering, American Railway Engineering and Maintenance of Way Association (later the American Railway Engineering Association), and the Association of American Portland Cement Manufacturers (later the Portland Cement

Association), and pointed out the urgent need for standards for concrete block.

In 1907, too, H. C. Henley, reporting for the committee on laws and ordinances, had expressed the belief of the association that proper ordinances and their strict enforcement were sorely needed to advance reinforced concrete as a form of building construction. The second report of the NACU committee on laws and ordinances in 1908 recommended an ordinance for reinforced concrete construction. As in the Association's orginal report, the bulk of the specification was concerned with mixed design, quality of materials, and placement of concrete.

The bylaws of the Association were amended in 1908 to set up a procedure for the adoption of standards: "Proposed standard specifications shall be submitted at the annual convention by a sectional committee and, as amended and approved, passed to letter ballot, which shall be canvassed within 60 days thereafter. Such specifications shall be considered adopted unless at least 10 percent of the total membership shall vote in the negative."

Results of this standardization procedure were almost immediate; in 1909, standard specifications were adopted for cement, portland cement sidewalks, and cement hollow building blocks.

In 1909, there was a flurry of proposed building regulations. A survey had been made of approximately 700 concrete buildings, and a study had been made of standard regulations for reinforced concrete construction. The results were contained in a report of the committee on laws and ordinances which also contained proposed building regulations on materials, joints, general design assumptions, bending moments, working stresses, and construction techniques. The Joint Committee on Reinforced Concrete submitted its third report and the NACU Committee on Reinforced Concrete also submitted a report.

In the annual report of the Executive Board for 1910, it was said in regard to standard specifications:

"The constantly increasing recognition of our standards throughout this country and in Europe should be a matter of gratification to the members, and it is hoped that the members may cooperate in the campaign to secure the general adoption of these specifications. A development of the last convention has indicated the desirability of preparing Recommendations for Standard Practice which would cover methods in detail, to be followed with rules governing the quality of the product and test requirements. This will simplify the work of the various committees, since many of them have found it extremely difficult to present a specification without some qualifications, and this has burdened the specification with matters not strictly relevant to it. By means of this subdivision, the committees can present a recommended practice covering the preparation of the product covered by the specifications."

In 1910, use of concrete for roads and highways was still in its infancy, with trials being made of its use as a base for other materials, even including precast concrete brick. Concrete as the wearing surface was still rather limited. There was a great deal of interest in reinforced concrete structures to resist fires and earthquakes. Because of the San Francisco building laws there had been no completed building of this type in San Francisco at the time of the earthquake and fire there.

The Author

Mr Maples is Secretary-Treasurer of the American Concrete Institute. He is a chemical engineering graduate of Michigan State College, and is a member of Tau Beta Pi (national honorary engineering society), the Society of Military Engineers, and the Association for the Advancement of Science.

By 1911, five new standards had been completed, including Building Regulations for the Use of Reinforced Concrete, Concrete Road and Street Pavements, Portland Cement Curb and Gutter, Recommended Practice for Reinforced Concrete, and Standard Specifications for Scrubbed Concrete Surface. In 1912, the Board again recognized the importance of standards in its annual report:

"It is apparent to your Board that the recommended practice and standard specifications of this Association are becoming more and more recognized and are exerting a constantly increasing influence. The work which

San Francisco earthquake *and fire led to study of concrete for housing.*

Bettman Archive

the Association is doing in this direction is still further exemplified in the many excellent recommendations made by the standing committees of the Association. It should be a matter of gratification to the members to know that the foreign concrete associations appreciate and follow to a very large extent all the standards and recommended practices which have been formulated by this Association. And in this country, it should be a further matter of gratification to know that our building regulations are either vitally incorporated, or have been used as a basis, in the framing of regulations in many of the largest cities in the country."

By 1913, when the name of the organization was changed to the American Concrete Institute, there were 16 standards. Added to the previous standards were those covering concrete drain tile, concrete architectural stone, plain and reinforced concrete floors, portland cement, stucco, standard methods for the measurement of concrete, and a number of recommended practices.

In 1913 an important investigation was undertaken, the results of which proved to be of great practical value in the formulation of building regulations. This covered reinforced concrete columns of large size and was undertaken by the committee on reinforced concrete and building laws in cooperation with the National Bureau of Standards and the Engineering Experiment Station of the University of Illinois.

American Concrete Institute

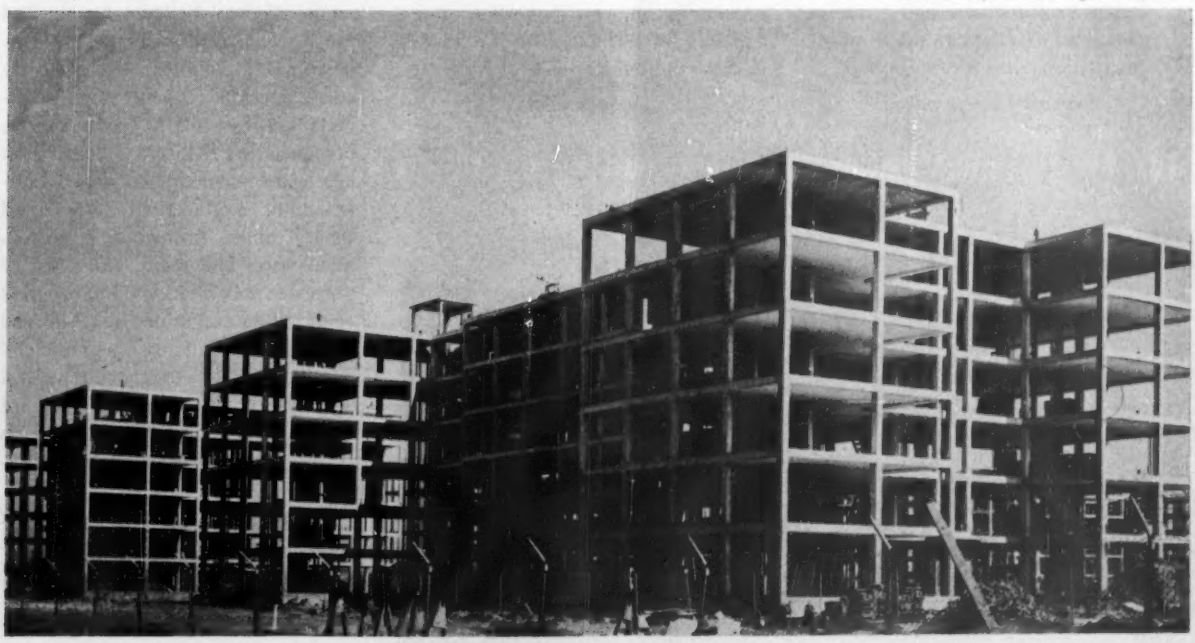
Complicated pattern *of Los Angeles' four-level traffic interchange is typical of 50-year development in use of concrete.*

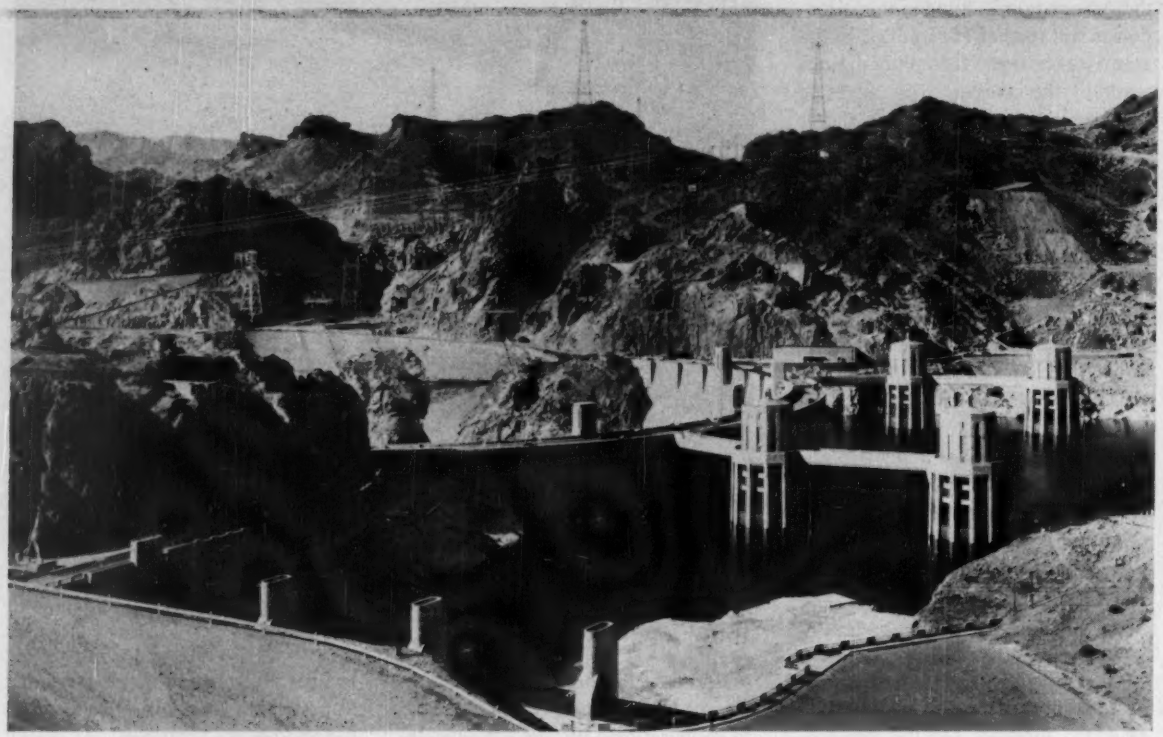
By 1914, the value of concrete for highways was being recognized and its use was reported in numerous parts of the country. Reflecting this interest, the committee on concrete roads and street pavements presented for adoption standard specifications for one-course highways, one-course street pavements, and two-course street pavements. Aggregate gradations, reinforcement, cross sections, grading, drainage, forms, joints, concrete placement, finishing, and curing were provided for.

At the Eleventh Annual Convention, February, 1915, President Rich-

Reinforced concrete framework *makes interesting pattern for one of New York's housing units.*

Lou Marinoff, N.Y.C. Housing Authority





Hoover Dam *after completion. An example of the extensive use of mass concrete.* Civil Engineering

ard L. Humphrey said in part:

"Although this organization has produced more than 18 standards and recommended practices, its work has only just begun. The existing standards must be revised, new ones developed, and there never was so much need for work of this character as at the present time. Permanency is the keynote of concrete and reinforced concrete. To secure this permanency, concrete must be properly and intelligently used, and the knowledge which will make this possible can only be secured through the development of standards embodying the latest experience in the use of the material. This Institute, in its technical endeavors, a record of which is in the ten volumes of Proceedings which have been issued, has acquired a high standing and an honorable place among the technical societies of this country and Europe."

Bonneville Dam *under construction. View shows concrete pouring stage.* Civil Engineering

By 1918, contributions to concrete technology dealt with effect of mixing time, blast furnace slag as aggregate, and effect of age and condition of storage. Basic information on the physical properties of concrete and methods of its production and handling continued to be developed during World War I. Work was reported on the effect of vibration, jigging, and pressure on fresh concrete; fire tests of concrete columns; and plasticity and temperature deformations in concrete structures. The committee on nomenclature reported definitions on aggregate, cement, concrete, construction, engineering design and theory, finish, formwork, reinforcement, tools and plant, and a list of suggested abbreviations. The progress report of the committee on reinforced concrete and building laws indicated continuing efforts to reconcile several sections of the proposed standard building regulations with similar parts of the current Joint Committee Report.

A special committee on units of design, recognizing the standardization of sizes and shapes already taking place in the steel industry, recommended in 1920 that designers of

concrete structures take greater pains to use a minimum number of types of footings, maintain the same cross section of columns through several stories, use beam and girder depths which would give minimum cost for reinforcing steel and concrete, provide for use of the same forms for floors and roofs and for uniformity of story height within a structure, and reduce the number of lengths and sizes of steel reinforcement.

In 1922, the work of a committee on Form of Standards resulted in the adoption of regulations concerning the form but not the substance of standards of the Institute. Pertinent points concerned the arrangement of materials and designations of subtitles in conformance with a standard form, details of numbering paragraphs, marginal headings, units of measurement, and a standard list of abbreviations and use of numerals. As rapidly as possible, existing standards of the Institute were revised to conform to the standard form. In 1924 there were in the revised form standard specifications for concrete floors, monolithic concrete sewers, and recommended rules for concrete sewer design, portland cement concrete pavement, and Tentative Standard Specifications and Building Regulations for concrete staves, concrete brick, concrete building block and building tile, concrete drain tile, plain concrete sewer pipe, sidewalks, and reinforced concrete sewer pipe.

In an address before the 1926 Convention of the Institute, President A. E. Lindau said in part:

"It is not a casual matter to prepare and sponsor building regulations involving expenditures of vast sums of money affecting the economic status of the building industry. It is not a mere incident to publish standard specifications for concrete structures and structural units. It is not a holiday job to search out and combat successfully destructive agents affecting seriously the performance of our concrete structures."

The proposed "Standard Building Regulations for Reinforced Concrete" were completed in 1928 — the result of the combined efforts of the ACI committee and the Committee on Engineering Practice of the Concrete Reinforcing Steel Institute.

Work which was to have far-reaching results was undertaken by Committee 105, Reinforced Column Investigation, in 1929. The outline of the work of this committee was indicative of the then current status of standards relating to the design of buildings:

"Recent efforts to standardize building codes have disclosed a wide variation in the method of designing reinforced concrete columns. These differences are not alone in the matter of form which the various formulas take, but in the resulting permissible loads on a given column, as a column design to carry a given load in one city would be very much too large under the provisions in effect in another city.

"An opportunity is now presented for an investigation of reinforced concrete columns which will clear up the points of difference and extend the knowledge of column behavior to the high strength concretes now rapidly coming into use. The support of every organization interested in reinforced concrete construction is needed to make this investigation adequate to the possibilities it holds forth."

The tests sponsored by this committee were carried out at the Engineering Experiment Station of the University of Illinois and the Fritz Engineering Laboratory of Lehigh University. Many interested trade associations and societies contributed to the fund necessary to carry out the work. When the report was presented in 1933, a fund of new information was made available. The committee presented recommended design formulas for spirally reinforced columns, tied columns, and splices in vertical bars. These test results and recommendations had considerable influence on later building codes.

During the first 25 years — from 1904 to 1929 — the American Concrete Institute and its predecessor had been identified directly or indirectly with most of the research work that had been carried on in the field of concrete. Its committee contributions were reflected in the various drafts of its building code which even in 1931 were being put to use by municipalities and other organizations.

Up to 1936, Institute specifications had covered materials, concrete products design, manufacturing, and construction practices. By arrangement with the American Society for Testing Materials, in 1936 ACI dropped its specifications for "over-the-counter" engineering materials. In turn, ASTM discontinued standardization efforts in design and construction practice. Anticipating this arrangement, the Institute had already given up activities in writing standards for concrete aggregates and had long

Typical *reinforced concrete building construction — showing formwork, reinforcement, concrete footings, and columns.*

Lou Marinoff, N.Y.C. Housing Authority

since relinquished the writing of specifications for portland cement.

By this time, architectural considerations were receiving so much attention that a new committee was organized to develop specifications and recommended practices for architectural concrete of the exposed aggregate type.

The 'thirties brought a revival of interest in the economical possibilities of concrete houses. Technological advances, such as lightweight aggregates, new information on coloring treatments, and commercial production of pre-cast concrete floor joists influenced this new interest.

The Institute's Building Code, tentatively adopted in 1936, was already the basis of an increasing body of municipal ordinances, in some cases adopted in large part by reference. The Building Code Committee proposed further revisions of the tentative 1936 Code to bring it up to date. A subcommittee on flat slabs had made an extensive analytical study of the applications of the principles of continuity to the design of flat slab structures and revised this section of the Code accordingly. Further revisions of the Building Code were adopted in 1941, 1947, and 1951. This Code has been approved as American Standard A89.1-1951. The latest revision incorporated new bond values made possible by the development of new-style deformed bars conforming to ASTM Designation A 305.

During World War II, national emergency specifications were issued to conserve critical materials of other types and ACI established emergency standard-making procedures that can be used again should another emergency arise. Soon after the war, interest centered on air-entrained concrete and on discussions of principles and procedures of design necessary to resist attacks by new weapons, such as the atomic bomb. Interest was high in problems relating to mass concrete structures and in use of cement-base paints, measurement of air in fresh and hardened concrete, influence of thermal properties of aggregates, and tests of the bond characteristics of plain and deformed reinforcing bars.

A need for a common language in delineation of reinforcing steel on design drawings resulted in the preparation and adoption of a "Manual of Standard Practice for Detailing Reinforced Concrete Structures." Here, too, the changed requirements for deformed bars resulted in a revision in 1951 which brought terminology into conformance with U.S. Department of Commerce Simplified Practice Recommendation R26-50, having to do with the numbering system for deformed bars. A companion volume dealing with the specific problems of highway work, "Manual of Standard Practice for Detailing Reinforced Concrete Highway Structures," was adopted as a standard in 1953.

Currently, the American Concrete Institute has 13 standards. In addition to the Building Code and the Detailing Manuals, they relate to concrete pavements and bases, shotcreting, application of portland cement paints to concrete surfaces, winter concreting methods, precast concrete floor units, farm silos, concrete mix design, cast stone, metal supports for reinforcement, and measuring, mixing, and placing concrete. More than 30 technical committees are studying these and other problems not now covered by standards with a view to revising old standards and developing new ones.

Two new committees have just been organized. One is to study and report on structural design and construction aspects of concrete masonry and the other is to investigate the feasibility of a recommended practice for the use of concrete in residential construction.

The Institute has taken an interest in the standardization program carried out through the procedures of the American Standards Association, with representation on a number of sectional committees covering such subjects as portland cement, fire tests of building materials, testing road and paving materials, plastering, excavations and foundations, and fire protection and fire resistance of materials. This is in addition to the American Standard Building Code Requirements for Reinforced Concrete, (ACI 318-51) A89.1-1951, for which ACI is proprietary sponsor under ASA procedures.

Do You

INDUSTRY can now determine whether it wants American Standard tables of fits and, if so, whether a proposal drafted by ASA committee B4, on Allowances and Tolerances for Cylindrical Fits,[1] has its approval.

The proposed new standard consists of a revision of the American Standard B4.1-1947, Limits and Fits for Engineering and Manufacturing, (Part I), supplemented by tables of preferred fits (hole-shaft combinations) and other data. It contains mainly the following information.

Definitions — With some minor changes, the definitions of basic concepts are the same as those in B4.1-1947.

Preferred Basic Sizes — The 46 basic sizes, from 0.0100 to 4 in., given in B4.1-1947, have been increased to 84 sizes, up to 21 in.

Acceptance of Parts. Reference Temperature — The principle that a part, to be acceptable, shall not exceed the specified limits of size, and the reference temperature of 68F (20C) have been reaffirmed.

Standard Fits — Five tables of fits cover three types: *running, locational,* and *force* fits, in nominal sizes from over 0.04 to 200 in.

Table 1, Running and Sliding Fits, gives nine fits, RC1 to RC9, ranging from a close sliding fit (RC1) for accurate location of parts which must assemble without perceptible play, to loose running fits (RC8 and RC9)

[1] This proposal is in accordance with the Draft Proposal for an ABC System of Limits and Fits agreed on by representatives of the national standards bodies in the United Kingdom, Canada, and the United States, and the Armed Forces in these countries, at the ASA Conference in New York, February, 1953. The ABC Proposal was published by ASA for the information of industry and discussed in an article in the May, 1953, issue of STANDARDIZATION (now THE MAGAZINE OF STANDARDS). Sponsor for ASA Project B4 is the American Society of Mechanical Engineers. Chairman of Sectional Committee B4 is Professor Z. R. Bliss, Brown University.

Want Standard Limits for Cylindrical Parts?

Industry Is Asked to Express its Opinion on Proposed American Standard

Cincinnati Milling Machine Co

One step *toward establishment of a cylindrical fit: Grinding the bearing diameter of a large sleeve gear assembly on a 10-in. plain hydraulic grinder.*

for use with materials made to commercial tolerances, such as cold-rolled shafting and tubing.

Table 2, Clearance Locational Fits, presents eleven fits, LC1 to LC11, for parts that are normally stationary, but should permit free assembly or disassembly.

Table 3, Transition Locational Fits, lists seven fits, LT1 to LT7, to be used where accurate location is important, but a slight clearance or interference is permissible.

Table 4, Interference Locational Fits, gives a choice between two fits, LN2 and LN3, for use where accuracy of location is of prime importance. These fits are not intended for transmission of loads.

Table 5, Force and Shrink Fits, contains five fits, FN1 to FN5, ranging from light drive fits for more or less permanent assemblies, to force fits produced by heavy pressure or shrinking.

Each fit is specified by the limits of the mating parts and the extreme values of the clearance or interference, expressed in thousandths of an inch. The various types of fits tabulated are graphically represented for parts with a nominal size of one inch.

Standard Tolerances — Table 6 lists fundamental tolerances in ten grades of accuracy (Grades 4 to 13), for each subrange of nominal sizes. Within the range from over 0.04 to 19.69 in., these tolerances are the same as in the ABC Proposal. For the range from over 19.69 to 200 in., the values are those of the proposed Canadian Standard.

Machining Processes — A graph showing tolerances that may be expected normally to be maintained in regular production with 12 different machining processes, from lapping to drilling, is included as a guide to the designer.

Companies Urged to Express Their Opinion — The former Tentative American Standard B4a-1925, Tolerances, Allowances and Gages for Metal Fits, contained tables of recommended fits. Since B4a-1925 became obsolete through ASA approval of B4.1-1947, Part I, many companies have indicated their need of new tables of fits. Some wanted to set up a system of fits for their own work and were looking for a generally recognized standard as a guide. Others reported that lack of such a standard caused them trouble due to the fact that different fits were used in their own plant and by other firms; for example, by suppliers of component parts. Also, some companies reported that lack of standard fits had led to wasteful diversity of tools and gages. On the other hand, there were some groups that held that the specification of fits should be left to the designer and, hence, that there was no need for an American Standard. Therefore, ASA Sectional Committee B4 now wishes to determine, by a canvass of those interested, whether there is a national consensus in favor of having an American Standard of preferred fits and, if so, whether the proposal it has developed is satisfactory to industry.

Copies Available From ASME — All who are interested in this problem should write to the American Society of Mechanical Engineers, 29 West 39 Street, New York 18, N. Y., for a copy of the Proposed American Standard. By reviewing the proposal and sending their comments to ASME for the information of ASA committee B4, those who are looking for American Standard tables of fits can help to have them established.

Positional Tolerancing of Manufactured Parts

by ALLAN H. CANDEE *and* CRAIG TELFER

Another phase in the current activity towards setting up improved practices for mechanical engineering drawings

Dimensioning

In dimensioning and tolerancing parts for interchangeable manufacture, we commonly specify limits of size and of position in two directions. For example, there are a maximum and a minimum diameter for round pins or bolts, and a maximum and a minimum diameter for round holes in which the pins or bolts are assembled. In addition to these limits for size, there are maximum and minimum limits on center distance. Fig. 1 shows what seems to be the usual method of dimensioning.

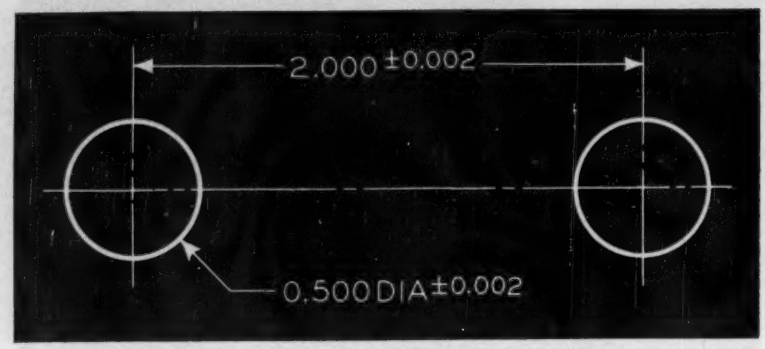


Figure 1 *A common method of dimensioning.*

Assembling

If, when two parts are assembled, two round pins of one part enter two round holes of the other and the dimensions are given as in Fig. 1, it may be possible to assemble some of the parts even when center distances are slightly outside the specified limits. This has long been known and can be readily seen if we assume cases where the pins are at their minimum diameter or the holes are at their maximum diameter, or where both conditions exist. Their assembly is clearly possible even if the center-distance tolerances are exceeded.

In the situation thus described it may be decided to accept such parts in spite of the fact that they are not within the limits of positional dimensions specified on the drawings. Sometimes, however, there may be other considerations than merely that of free assembly.

Proposal for Adoption of "MMC"

(maximum material condition)

A proposal has been made to add an abbreviation or symbol on the drawing to authorize the acceptance of parts that are outside the limits given by the drawing in the way indicated above.

This proposal represents a way to avoid rejecting parts that can be freely assembled, but it has not been clearly indicated that there is then an increase in looseness of fit; and it is probable that many who are inclined to favor the proposal have not examined the facts closely enough to be aware that a loss of precision occurs. The proposal referred to can be found in Draft British Standard 308:1952, Recommendations for Engineering Drawing Practice (issued by the British Standards Institution for comment).[1] The following is a quotation from page 36, Section 19.f.:

" — However, in many applications the limits on centre distance may be exceeded if the features are not on the maximum metal limits of size, because of the increased clearances between mating features. In such cases the limiting dimensions of center distance should be marked with the letters 'MMC' (maximum metal condition) —. The centre distances could then be checked by a simple gauge similar to part A in Fig. 59(a) instead of by direct measurement."

It is easily seen that if the pins C are at their minimum diameter, or if the holes in part B are at their maximum diameter (or if both of these conditions exist), parts A and B can be assembled even if the limits on the 2-inch center distance are slightly exceeded.

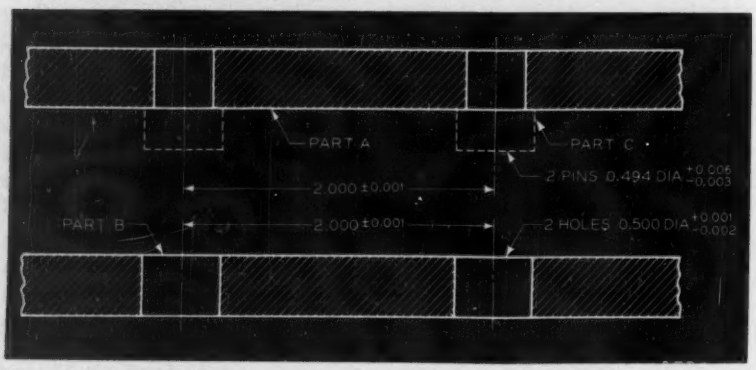


Figure 2 *Shows the kind of example under discussion. This is similar to Figure 59 in the quoted publication except that here the pins are shown as separate parts C assembled permanently in part A.*

[1] Copies of the approved British Standard 308:1953 Engineering Drawing Practice, have just been received by ASA.

If different words are used in talking about the situation illustrated, we see an aspect of the proposal that may at first be overlooked. Suppose we say it this way: If parts A are selected in which the pins are at their smallest size, then parts B can be assembled even when the center distance of the holes is slightly over or under the drawing limit. Or, if parts B are selected in which the holes are at their maximum size, parts A can be assembled even when the center distances of the pins (or of the holes) are outside the drawing limits. If both of two mating parts are allowed to vary in this way, the result would appear to be a form of selective assembly, which of course is often practiced; but it does not conform to what is ordinarily thought of as interchangeable manufacture.

Loss of Precision

Even in this comparatively simple case of tolerancing there are so many possible combinations of maximum and minimum measurements that a detailed study of them all becomes tedious. But a consideration that may also be important is the amount of variation in the relative position of parts A and B, and the effect on this variation of allowing the proposed increase in the limits of center distance. When the proposed meaning of "MMC" is applied, it is found that the variation in relative position of the parts is increased. There are cases where this would not be desirable or even allowable, and it should always be considered.

Mr Candee, a Fellow of the American Society of Mechanical Engineers, is a gear consultant, located in Rochester, New York. Mr Telfer, a member of ASME, is Standards Engineer at the Camera Works of Eastman Kodak Company, also in Rochester. Both have been active as members of Subcommittee 5, Dimensioning and Notes, ASA Sectional Committee Y14, Drafting Practice.

Subcommittee 5 has been working for over three years to revise the "Dimensioning" sections of American Standard Z14.1-1946, Drawings and Drafting Room Practice. It is expected that Subcommittee 5 will submit a proposal for general comment some time this fall.

The chairman of Subcommittee 5 is Norman E. Brown, Chief Designing Engineer, Taft-Peirce Manufacturing Company, Woonsocket, Rhode Island.

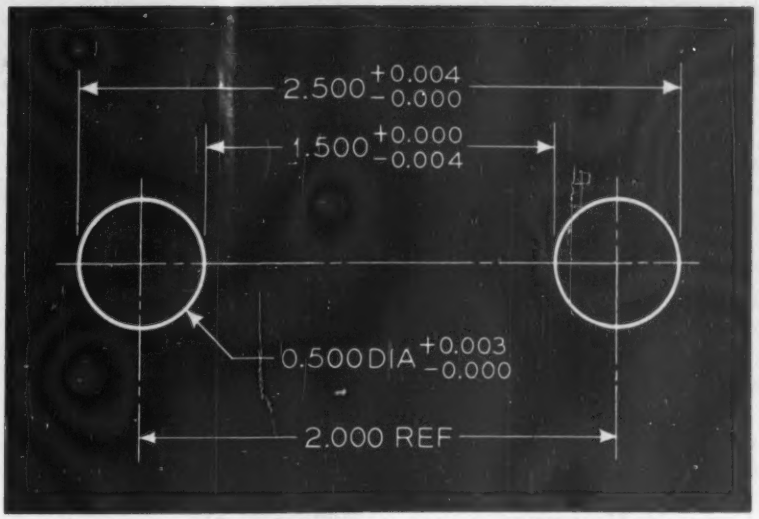


Figure 3 *Double tolerancing avoided.*

A General Rule of Tolerancing

The method of dimensioning which is the source of this discussion, and some confusion, does not conform to a general rule which is to be found on page 30 of the BSI publication itself, namely:

Section 14.b " — and no surface, line, or point should be located by more than one toleranced dimension."

It is apparent that this rule is not followed when tolerances are given for the size of a round hole or pin and also for the position of its center. The rule could be followed and the special MMC proposal could be made unnecessary, if the dimensions were given as illustrated in Fig. 3.

If a requirement is clearly recognized, the information on the drawing can always be arranged to specify it definitely. Double tolerancing, however, is always in itself indefinite.

Gages

Gages can always be made to check for whatever requirements are decided to be important. It will not, however, be possible to check double tolerancing, and GO and NOT GO, by only one gage in the form of one part of an assembly.

Interchangeable Assembly and Interchangeable Manufacturing

"Interchangeable assembly" implies only that parts can be assembled interchangeably. We often use the term "interchangeable manufacturing"; the (British) Dimensional Analysis of Engineering Designs uses also "interchangeable production." These expressions bring in more than the requirement of free assembly. They include all the things that have to be done to make parts for interchangeable assembly, and to assemble the parts into usable products. Interchangeable manufacturing requires instructions that are definite, because people do not act in a predictable way when their instructions are "if X happens, Y can be permitted." For interchangeable assembly (in other words, for what must be done *after* parts have been made) the "MMC" method authorizes a widening of limits, which may be all right, provided that only one of the assembled parts is allowed to vary from stated tolerances, and provided functioning is not impaired by the resultant increased looseness. People who must arrange to get a complex sequence of operations completed to carry on interchangeable manufacturing appear to feei unanimously that instructions must be as definite and clear as possible, with the smallest possible leeway for individual decisions about requirements; when questioned, they appear to believe that "MMC" dimensions do not meet this need.

Recapitulation

Objections to the proposal to apply

"MMC" (maximum material condition) to toleranced center distances on drawings, to indicate that the tolerances may be increased according to measurements of actual parts, are listed as follows:

(*a*) It would be a departure from interchangeable manufacture and would become a form of selective assembly.

(*b*) The loss of precision that would result may be overlooked.

(*c*) If free assembly is the only requirement, a suitable method of dimensioning is available that avoids the indefiniteness of "double tolerancing."

Engineering Management and "MMC"

American industry has, for years, been trying to relieve its engineers from the crushing burden of detail that takes time away from engineering activities. To do this, whole departments of specialists have been created. Factories have production engineers to arrange economical processing, quality control engineers to analyze inspection problems, tool designers, gage designers, drawing checkers, estimators, and other groups, each with a segment of the work that must be done to produce goods that conform to engineering specifications. The design engineer's duty is simplified, so that he only has to tell the specialists what he intends; he does not have to do their jobs for them. By the "MMC" proposal, dimensioning methods depend on gaging methods, thereby making it necessary for the design engineer to solve gaging problems. That would seem to be a step backward. It tends to complicate the engineer's duties, rather than to simplify them. In that sense, it is contrary to the course industry is taking to make the best use of its engineers.

Conclusion

It is hoped that this article will suggest to those actively interested in drawing practice, that a very careful examination should be made of the proposal discussed, particularly with the help of those who use the drawings to direct manufacturing procedures.

Recent Changes in

THREE staff members of the American Standards Association have been promoted to more responsible positions and one new engineer has been added to the staff.

George Porter Paine has now been named assistant secretary. In this capacity he will have certain administrative responsibilities as assistant to Vice Admiral G. F. Hussey, Jr, Managing Director and Secretary. He will continue as Director of Public Relations.

George Porter Paine

J. W. McNair, formerly in charge of electrical, electronic, photographic and other groups of standardization projects, has been appointed to the newly created post of Assistant Technical Director. Mr McNair will assist Cyril Ainsworth, Technical Director, in supervision of all ASA's work on standards. This now includes mechanical engineering, electrical engineering, safety standards, photography, acoustics, optics, building and construction, mining, consumer goods, office equipment and graphical standards, including drawings and drafting practice, symbols, and abbreviations. Mr McNair is continuing as Secretary of the United States National Committee of the International Electrotechnical Commission, a position he has held since the USNC was made a part of ASA operations in 1931.

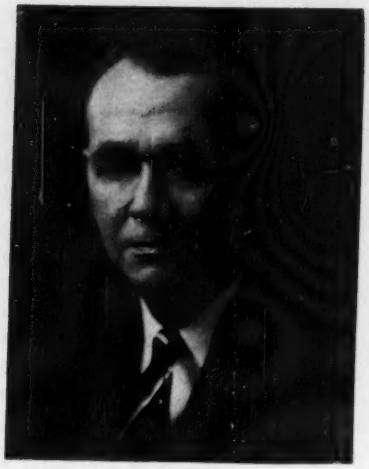
S. David Hoffman replaces Mr McNair as engineer in charge of all electrical projects, as well as those in the fields of optics and acoustics. He will have charge of all projects under the supervision of the Electrical Standards Board and its two divisions — the Communications and Electronics Division and the Power Division. Some of the subjects considered by the 40-odd electrical sectional committees under the jurisdiction of the ESB are transformers, circuit breakers, electric lamps, electrical measuring instruments, wire and cable.

F. Crampton Frost, formerly manager of the Standardizing Department of Dumont Laboratories, Inc, is now responsible for standardization projects in materials, construction, and mining. He succeeds the late H. M. Lawrence. The work formerly handled by Mr Lawrence in connection with building code standards will now be handled by A. C. Hutton, ASA's Washington representative.

Mr Paine joined ASA's staff as Executive Assistant to Howard Coonley, then chairman of ASA's Executive Committee, in 1946. A graduate of the Wharton School of Finance and Commerce of the University of Pennsylvania, he had been connected with the John Price Jones Corporation of New York and was on the staff of the National Association of Manufacturers prior to the war. During the war he served with the Navy in the South Pacific and Atlantic theatres. Mr Paine has been in charge of ASA's membership, public relations, and publicity programs since 1948.

Mr McNair has been with ASA since 1930. He is a graduate of the University of Virginia with an E.E. degree. Before joining the ASA staff he had been acquainted with ASA through his work with the National Electric Light Association (now the Edison Electric Institute), and the Standards Department of the Ameri-

ASA's Staff



J. W. McNair

can Institute of Electrical Engineers. He had compiled data for use in connection with the American Standard National Electrical Safety Code C2; had worked on a number of AIEE standards which subsequently have become American Standards; and had done preparatory work on the American Standard Definitions for Electrical Terms, C42.

Mr McNair has seen many changes in ASA's electrical program since he has been in charge. During this time, the Electrical Advisory Committee, originally the supervisory group for this program, was reorganized into the Electrical Standards Committee (now the Electrical Standards Board) and given a constitution which permitted it to act as a sponsor for projects within its field. As a result, it assumed sponsorship and direct supervision over a number of important projects such as C8, Wire and Cable; C37, Power Switchgear; C50, Rotating Electrical Machinery; and C57, Transformers. Its leadership helped to settle controversies that formerly had hampered the development of standards in these fields. Mr McNair has also been vitally interested in the initiation of standards work on photography. Originally known as Sectional Committee Z38, the work has grown to the point where it has now been reorganized into five sectional committees — PH1, Characteristics of Photographic Films, Plates, and Papers; PH2, Photographic Sensitometry; PH3, Photographic Apparatus; PH4, Photographic Processing; and PH5, Photographic Reproduction of Documents. These committees now report to an especially organized Photographic Standards Board.

In addition to his regular staff work on projects, Mr McNair has served as secretary of sectional committees on Acoustics, Z24; Electric and Magnetic Magnitudes and Units, C61; Wood Poles, O5; and Electrical Measuring Instruments, C39. During the war he directed the work of American War Committees on Radio, C75 and on Photography and Motion Pictures, Z52. These committees made important contributions to the war effort, making possible use of substitute materials and interchangeability of parts.

As secretary of the United States National Committee of the International Electrotechnical Commission, he has represented the USNC at nine meetings in Europe.

Mr Hoffman has been assistant to Mr McNair, handling much of the work on specific projects, since 1949, with a break of two years for service in the U.S. Navy.

During the War (1942 to 1946) he served in the Navy and completed the V-12 program at Yale University where he received a B.E. in electrical engineering in 1945. Prior to World War II, he worked for the American Gas and Electric Service Corporation and for Jacobs Brothers. He was an equipment engineer with the Western Electric Company before he joined the ASA staff in 1949.

Mr Frost comes to ASA from the Allen B. Dumont Laboratories, Inc, where he was manager of the Standardizing Department. A graduate of Cornell in Civil Engineering with a specialty in sanitary engineering, his first job was with Tenney Engineering, Montclair, N.J. There he had charge of design, production, and installation of the company's air conditioning projects. There, too, he had his first experience in designing a stratosphere test chamber, the first of its kind in the country. During the war he returned to Tenney Engineering to carry on the greatly expanded work on test chambers to meet Government needs. In the meantime, he had been a construction safety engineer on the Bayonne Dry Dock Construction Project. He had been with Dumont Laboratories for 10 years before joining ASA, first as supervisor of the Specifications Section, then as head of the engineering services department, and finally as Standardization Manager. His experience has given him an understanding of AAS work because of his use of American Standards in these companies.

Mr Frost will serve as secretary of the Construction Standards Board, and the Mining Standards Board.

S. David Hoffman

F. C. Frost

New Standards Reflect the Growth in Power Circuit Breaker Industry

by V. L. Cox

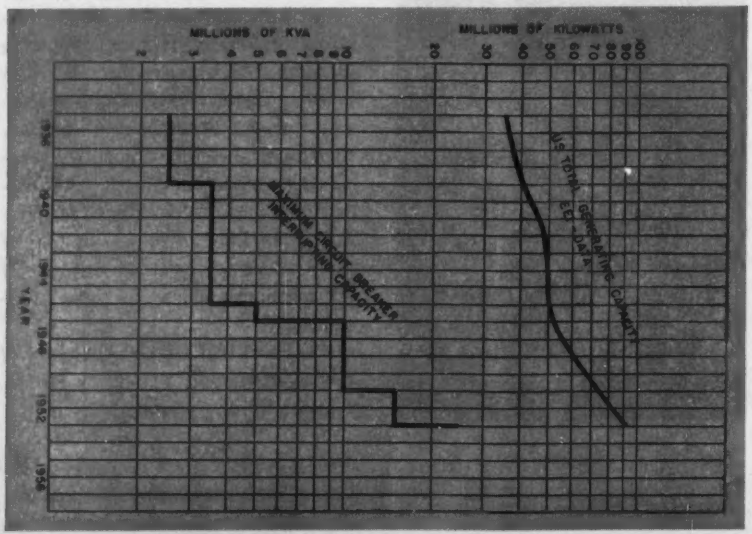
POWER circuit breakers, the traffic cops that guard the highways of our great electric power systems from Times Square and the Golden Gate to the farm villages of the great plains, have really "grown up" in the last decade. The biggest of them have over seven times the stature they had ten years ago. This is just layman's language for the assertion that the maximum interrupting ratings of breakers has jumped from 3.5 million kva in 1944 to 25 million in 1954. This represents progress with a capital "P" when, by way of comparison, it is recalled that total generating capacity in 1953 was only about twice that of 1943. (See Figure 1)

It is not the purpose of this article to make this fact the basis for a prophecy of things to come except to point out that if the much publicized prediction of "a trillion kilowatt hours by 1965" becomes even a near reality, it is almost certain that still higher rated circuit breakers will soon be needed. It would indeed be difficult to find anyone willing to risk a prediction as to when, if ever, the upward trend will stop and a protracted era of "stability" ushered in during which the work of standardization could progress without encountering the complex problems inherent in a continual push toward new horizons.

It is in the climate of such a push that the ASA Sectional Committee on Power Switchgear, C37, and its Subcommittee on Power Circuit Breakers has labored over the last few years to bring up-to-date the American Standards on Alternating-Current Power Circuit Breakers.

With the recent publication of four revised standards, this assignment is completed and up-to-date American Standards are now available to the industry covering the entire range of breaker types and ratings in current use.

The rapid tempo of development in breakers of higher interrupting capacity and operating voltage during the last two or three years has posed many problems to Sectional Committee C37 and its subcommittees. Manufacturers and users have been carrying on, concurrently, highly accelerated programs of breaker and system development, respectively. It has been the task of the ASA committees, working through the American Institute of Electrical Engineers, the National Electrical Manufacturers Association, and the Light and Power Groups, to arrive at standards which would meet the needs of both these programs. This difficult task has been achieved, but only through the closest coordination of effort between manufacturer and user groups; the resulting standards stand as a tribute to the cooperative spirit which has characterized the conduct of all concerned.



While a major objective of Sectional Committee C37 has been to develop standards for new breakers in the high ranges of interrupting capacity and voltage not covered by the previous standards, many other matters have received careful scrutiny resulting in new and revised standards. Among these, the following are some of the more important:

1. New or clarified definitions of terms have been developed to provide a firmer ground for understanding the intent of rating, application, and testing standards.
2. Temperature rise standards, previously established only for oil circuit breakers, have been developed for oilless breakers.
3. A complete section has been added covering a simplified method of calculation of fault currents for the benefit of application engineers.
4. Standard nameplate data has been broadened in scope to include all significant rating data needed to apply breakers properly.
5. The Test Code has been completely rewritten to classify the tests made on circuit breakers into two

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Mr Cox is manager of laboratories, Switchgear and Control Division, General Electric Company, Philadelphia. He has been chairman of Sectional Committee C37 on Power Switchgear since 1951.

The four standards that complete the series of American Standards on alternating current power circuit breakers are: American Standard Alternating-Current Power Circuit Breakers, C37.4-1953; Methods for Determining the Rms Value of a Sinusoidal Current Wave and a Normal-Frequency Recovery Voltage, C37.5-1953; Schedules of Preferred Ratings for Power Circuit Breakers, C37.6-1953; and Test Code for Power Circuit Breakers, C37.9-1953. Other standards in the series are American Standard Rated Control Voltages and Their Ranges for Power Circuit Breakers, C37.8-1952, and Guide Specifications for Alternating-Current Power Circuit Breakers, C37.12-1952. (For prices and other details, see back cover.)

categories: (1) Design tests, and (2) Production tests. The purpose and accepted methods of conducting each of the tests are clearly described, providing a sound basis for understanding between the manufacturer and user.

6. Complete rules for the determination of interrupting rating factors for reclosing duty have been established, supplemented by a convenient tabulation of factors for the more commonly used reclosing cycles.

In addition to these and to the completion of the Preferred Rating Schedule, many minor changes of an editorial nature have been made to bring references up to date and increase the general usefulness of the standards.

The economic significance of power circuit breaker standards can be appreciated from the fact that the annual industry sales of power circuit breakers is at present of the order of $250,000,000. Since the first issue of these standards in 1945, the total number of standard ratings has been reduced from 121 to a present total of 76, and in that period the range of voltage and interrupting ratings covered has been considerably extended. The economic saving resulting from this kind of standardization, while difficult to evaluate accurately, is obviously very substantial. These savings through standardization have kept costs from rising to the point where they would have gone had not a planned standardization program been implemented.

Important as the completion of this revision of the standards is, the committee's work, like that of the housewife, is "never done." Already, system designers and manufacturers are seriously working on plans for bigger systems and breakers of higher ratings to control them. A project to establish a new and simpler method of defining the interrupting performance of all types of circuit interruptors is being actively promoted by the AIEE Committee on Switchgear with the objective of providing a basis for interrupting ratings which will meet with international approval, and at the same time simplify the work of the application engineer. Searches for new and more fundamental knowledge in the field of circuit interruption are being continually pressed by educational and research institutions as well as by manufacturers and users, and advances in the art resulting therefrom may at any time introduce substantial improvements in circuit breaker design.

Realization of any of these plans or hopes may profoundly affect standards, and it is the continuing task of ASA Sectional Committee C37 to keep the standards abreast of these advances so that the industry may always be equipped with the most up-to-date model of this very necessary tool.

Plans for IEC Golden Jubilee Underway

P. H. Chase *(standing), Philadelphia Electric Company, chairman of the committee in charge of planning for the Golden Jubilee of the International Electrotechnical Commission, is here giving details of the program to members of the United States National Committee of IEC. The Jubilee is to be held at the University of Pennsylvania in September. Meetings of 47 technical committees and subcommittees are scheduled. The meetings will be attended by more than 200 delegates and guests from other countries. In addition, special events include technical trips and plant visits and a two-day trip to Washington. Four addresses will be given at the Golden Jubilee Day Celebration. The speakers, who will cover different fields of activity, are: Communications — Dr Hakan Sterky, Director of Tele-Communications, Swedish Telegraph Administration; Power — M. Pierre Ailleret, Director of Electricité de France; Science — Dr Lee A. DuBridge, President, California Institute of Technology and Chairman, Advisory Committee on Science to the President of the United States; General — Lord Waverly, Chairman of Port of London Authority, and Past President, British Standards Institution.*

Those present at the program conference above are:

Left to right (facing): E. F. Seaman, Department of the Navy, Bureau of Ships; Walter C. Wagner, Philadelphia Electric Company; A. A. Brainard, president, U.S. National Committee of the International Commission on Illumination; P. H. Chase, Philadelphia Electric Company, chairman of the IEC Golden Jubilee General Committee; J. W. McNair, American Standards Association, Secretary of the U.S. National Committee of IEC; R. C. Sogge, General Electric Company, president of the USNC; Vice Admiral George F. Hussey, Jr, U.S. Navy (Ret.), American Standards Association, treasurer of the USNC; C. C. Chambers, vice-president of the University of Pennsylvania; W. E. Caldwell, Consolidated Edison Company of New York; A. G. Christie, Johns Hopkins University; K. M. Irwin, Philadelphia Electric Company; J. S. Pettibone, American Society for Testing Materials. Center (L to R): V. L. Cox, General Electric Company, Howard H. Weber, U.S. Rubber Company; L. G. Cumming, Institute of Radio Engineers, Axel G. Jensen, Bell Telephone Laboratories.

GOVERNMENT STANDARDS

11

Material Management Through Standards by New York City Housing Authority

by S. P. Kaidanovsky

Since the end of World War II, the New York City Housing Authority has become the largest landlord and the largest builder of residential building in the United States. It builds public housing projects under Federal, State, and City-aided programs, and since 1946, when it resumed construction after the end of World War II, has completed approximately 53,000 permanent low-rent apartments, and at present has another 18,000 under construction.

Federal, State, and City Aid. — The public housing program directed by the Authority was made possible by Federal, State, and municipal laws and authorizations. The Congress of the United States, by passage of the United States Housing Act of 1937 and the Housing Act of 1949, provided resources for public housing. The New York State's Public Housing Law, enacted in 1939, provided for a State-aided program of low-rent housing. The law has been amended four times since the end of World War II (the last time in 1950) to increase the size of the program and the rate at which it could be carried out. Part of New York City's restricted housing means goes for the cash subsidies it may be required to contribute to state-aided projects. In addition to helping subsidize state-aided projects, the City also provides subsidies for projects which it authorizes the Authority to build without either Federal or State aid.

Philip J. Cruise
Chairman, N.Y.C. Housing Authority

Membership of the Authority. — The New York City Housing Authority now is composed of five members: Philip J. Cruise, Chairman; John S. Parke, Vice-Chairman; William Wilson, Frank R. Crosswaith, Thomas J. Shanahan, members; Gerald J. Carey, Executive Director; and Harold Klorfein, Secretary.

Operating Departments. — There are five operating departments — Development, Management, Legal, Control and Personnel — and the Office of the Secretary.

Purchase Division. — The Purchase Division, previously a unit of the Control Department, was transferred recently to the Office of the Secretary of the Authority. This division under the direction of Harry A. McArdle, Chief of Purchase, consists of four sections — Commodity Catalog, Procurement and Surplus Sales Activity, Specifications, and Clerical. The Chief of Purchase procures material in accordance with requisitions submitted by different units of the Authority.

Standards Program

The development of a standards program for materials and equipment began in 1948, to cope with the rapid growth of the Authority and facilitate the carrying out of top management policies. The first step was the formation of a Committee on Standardization of Commodity Specifications. This committee was empowered by the Executive Director of the Authority to adopt standards and promulgate specifications for all materials, supplies, and equipment used in the installation, operation, and maintenance of the projects erected and managed by the Authority.

Harold Klorfein
Secretary N.Y.C. Housing Authority
Chairman Standards Committee

Committee on Standardization of Commodity Specifications

Committee Membership.—The committee consists of the following — Secretary of the Authority, *Chairman;* Chief of Purchase, *Secretary;* Specification Writer; Representative of the Development Department; Representative of the Management Department; Inspector of Supplies; Chief of Systems Division; and Chief of Office Services. The last two members function only when discussion centers about office machines, printing, office furniture and equipment. With respect to office machines and printing, the Chief of Systems is considered as representing the operating division. With respect to office furniture and equipment, the Chief of Of-

Mr Kaidanovsky is Technical Dirtctor of the Management and Technical Services, New York. He was formerly chairman, Federal Interdepartmental Standards Council; technical consultant, Federal Specifications Board; and editor Standards World.

Lou Marinoff, N.Y.C. Housing Authority

Lillian Wald *development, New York, gives clean, light, well-equipped apartments in place of crowded slums (right).*

fice Services is considered as representing the operating division. Each member selects an alternate to serve in his absence.

Powers and Duties of the Committee. — The committee considers the quality, performance, and price of commodities regularly procured by the Authority to determine which materials and equipment meet the Authority's requirements.

The Chief of Purchase reports to the committee what materials and equipment should be standardized. After consent of the committee is obtained, the Specification Writer of the Purchase Division staff prepares the specification for presentation to a subsequent meeting of the committee. The specifications are then discussed by the committee and, if considered adequate, are approved for publication.

Promulgation of Specifications. — The standard specifications, after approval by the committee, are duplicated and distributed by the Purchase Division. After a standard specification has been issued, its use becomes mandatory by all departments of the Authority.

Review of Specifications. — If a department head feels that certain standard specifications promulgated by the Authority are unsuitable to the needs of his Department, he may request reconsideration of such specifications. The committee may examine such specifications with the view of changing its requirements, and subsequently issue an amendment.

Commodities for Which Authority's Specifications Are Not Available. — In case of commodities for which standard specifications have not yet been developed by the Authority, division heads initiating requisitions are preparing specifications which meet their needs. The Purchase Division reviews these specifications, modifies them where necessary, and submits to the prospective bidders a complete specification for each proposal.

Waiver of Specifications. — Though standard specifications are mandatory on all departments of the Authority, their use may be waived by the Secretary of the Authority if reasons for such waiver are substantiated by the head of the department requisitioning the materials or equipment.

Revision of Specifications.—To keep abreast of technological advances and improve test methods, a periodic re-examination of standard specifications is made by the Purchase Division. The revision of existing specifications has resulted in improved quality for many materials and a great deal of equipment, including rubber hose and matting, refuse cans, floor wax, electric fans, file cabinets, among others.

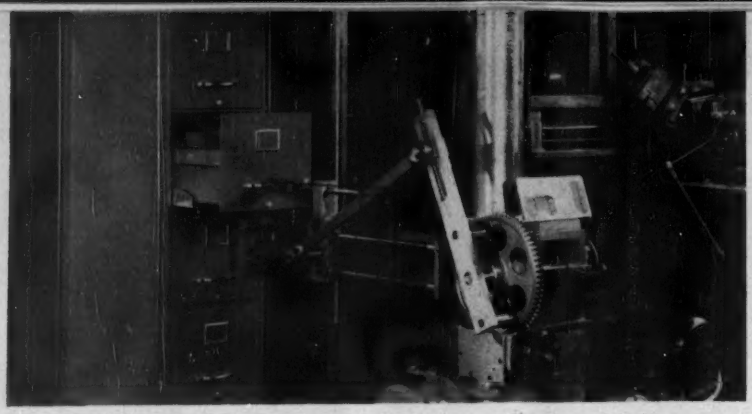
Use of Nationally Recognized Standards and Specifications. — Wide use is made of nationally recognized standards and specifications. A review of the Authority's specifications reveals that Federal Specifications, ASTM Standards, American Standards, National and State Sanitary Codes, and Underwriters' Laboratory Standards are adapted or incorporated in the Authority's standard specifications by reference. The Authority's procedure in developing new specifications is first to ascertain if pertinent standard specifications are already in common use and to try to adapt its needs to existing specifications. However, if available specifications do not meet the particular requirements of the Authority, then new specifications are prepared.

Standard Classification of Commodities

The Division of Purchases has recently revised its commodity classification and has established a Standard Classification of Commodities.

Groups. — There are at present 21 commodity groups numbered and titled as follows:

Group No.	*Title*
01	Appliances; Domestic, Household and Parts
02	Office Equipment; Furniture and Business Machines
03	Machinery and Mechanical Equipment
04	Community Activity Equipment and Supplies
05	Automotive Equipment and Supplies
06	Office Supplies; Paper; Photographic Supplies; Printing and Stationery
07	Services
08	Janitorial and Exterminating Supplies and Equipment
09	Textile Products, Rope and Cordage, and Window Shades
10	Fuels and Lubricants
11	Grounds Maintenance Supplies and Equipment
12	Structural Materials and Supplies
13	Hardware, Metals and Metal Products



Office equipment is tested *by City Housing Authority. This machine tests durability of file cabinets; also tells how much pull it takes to move drawers.*

14	Paints; Painter's and Decorator's Supplies; and Floor Covering except Floor Tile
15	Pipe; Pipe Fittings; and Plumbing Fixtures and Accessories
16	Electrical and Electronic Supplies and Equipment
17	Heating Supplies and Equipment
18	Elevator Supplies
19	Safety and Protection Supplies and Equipment
20	Tools and Implements
21	Instruments: Control; Indicating; Measuring; Recording and Testing

Classes. — Each group is subdivided into classes. For example, commodity group 01 — Appliances, Domestic, Household and Parts is subdivided into 8 classes:

Class No.	*Title*
01	Air Conditioners and Dehumidifiers
02	Coolers: Water
03	Ranges: Electric; and Parts
04	Ranges: Gas; and Special Parts
05	Refrigerators; and Parts (Except Door Gaskets and Trays)
06	Trays: Refrigerator; Ice Cube and Defrosting
07	Gaskets: Refrigerator Door
08	Gas Range Parts; General

The 21 Commodity groups are subdivided into 241 classes.

Designation of the Authority's Standard Specifications

The Authority's standard specifications are designated in conformity with its Standard Classification of Commodities. The designation is based on the two-digit group and the two-digit class, with the addition of one or two letters indicative of noun class name of the commodity. The date of approval on latest revision of the specification is placed below its designation. For example, the designation of the New York City Housing Authority Specification for Gas Range, Domestic, is:

Spec. No. 01.04RD
Revised: 11/13/53

This designation indicates:

Group — 01 — Appliances, Domestic Household and Parts
Class — 04 — Ranges: Gas
RD — Ranges, Domestic

Index of Standard Specifications. — There are at present 132 Authority's standard specifications. The Index of these specifications consists of two parts: (1) A numerical index by commodity groups and classes; and (2) An itemized alphabetical listing of commodities.

Approved Manufacturers Brand Lists

Approved Manufacturers Brand Lists are utilized for those commodities where construction varies so that it is difficult to write a detailed specification which would include all the acceptable makes. Approved brand lists were prepared by the Authority for such commodities as Visible Index Equipment, Electric Adding Machines, Mimeograph Duplicators, Typewriters, Office Furniture, Waterproof Clothing and Boots, and others.

Procedure for the development of Approved Brand Lists is same as for standard specifications. Such lists are issued in specification form.

In order to be included on the Approved Brand List, an application is made to the Chief Purchase Division, indicating the name of the applicant, the name of the brand, and the name of the manufacturer of the brand offered for consideration. The applicant needs to prove to the satisfaction of the Committee on Standardization of Commodity Specifications that the equipment being offered for consideration is equal to the competitive machine on the Approved List. All expenses in connection with the necessary examination or tests as determined by the Standards Committee are paid by the applicant. Manufacturers of machines included on the Approved List are requested to notify the Authority on any changes in construction, component parts, or materials made subsequent to the date of the specification. Changes that adversely affect the quality or performance of the equipment are cause for removal from the Approved Brand List.

Standard Commodity Catalog

One of the factors that have complicated the procurement program of the Authority is the lack of standard descriptions for the variety of items used in its operations.

A recent analysis disclosed that a single electric switch was described in a different manner by each of five Authority's projects using it for the same purpose. The lack of standard item descriptions was partially responsible for the delays encountered in effecting consolidated purchases for materials and equipment. In order to overcome these difficulties, a Catalog Section has been established in the Purchase Division assigned to compile a standard commodity catalog, containing standard item descriptions and standard code numbers for each item of material, equipment, and parts used in operation of permanent projects. The Catalog Section is now in process of compiling such a standard stock catalog. Item code numbers have not yet been assigned.

Mr McArdle shows test *of floor wax samples on asphalt tile panel.*

It is contemplated that a 10-digit number may be used, the first four numbers being significant of group and class.

Items carried in stock are now identified under the commodity classification in 21 groups.

Inspection and Testing of Commodities

Commodities purchased by the Authority are inspected and tested to ascertain if they meet the requirements of the specifications. Methods of inspection and tests are outlined in each specification. The Authority's inspection and testing is concentrated on commodities representing the greatest dollar value of purchases.

Tests for cleaning efficiency of detergents are made by laboratory methods prior to award, to determine compliance with the standard. Coal samples are regularly taken and forwarded to the New York City's Testing Laboratory for analysis of moisture, ash, fixed carbon, Btu, and fusion point. Fuel oil is regularly checked for temperature at the loading terminal and sampled periodically for testing. Paints are regularly sampled and tested by a commercial laboratory. Other materials are periodically sampled and tested to insure compliance. A force of ten inspectors is employed in checking commodities purchased by the Authority.

In order to test durability of window shade cloth, it became necessary to devise a test method that would simulate actual service although accelerated to obtain results in a reasonable length of time. After consultation with industry and testing laboratories, it was concluded that exposure to sunlight under glass in Florida would closely simulate actual service and accelerate the test results. Such accelerated tests furnished data to evaluate expected wearing life of various makes of window shade cloth. These tests were conducted for several years from 1950 to 1953. Through this pioneering effort in durability testing, the Authority has set up a standard that assures the procurement of long-lasting window shades.

A comparative fatigue test on elevator ropes of five leading manufacturers was initiated by the Authority. Based on the result of this test, specification were modified to include standards of wearability as well as tensile strength. Wear tests are being conducted on various types of bibb and faucet washers at the Management's Department Central Shop.

Such tests were planned with the objective of obtaining *performance data* related to actual service conditions. The information gathered was used to improve the Authority's specifications by inclusion of performance requirements, thereby obtaining greater value, longer service, and lower maintenance costs.

Standards Promote Efficient Operation

The development of standard specifications resulted in reduction of the number of types, varieties, sizes of materials, and equipment to the minimum necessary for efficient operation.

Before the adoption of a standard, several varieties of disinfectant of unknown strength were used. Now, the standard specification provides for only one type with a test for bacterial potency. Similarly, a detergent for general cleaning purposes has been standardized — only one type of detergent is used at present. The reduction of varieties has been applied to many other materials and equipment, such as brooms, brushes, mops, pipe and sewer cleaning tools, flashlights, lubricants, and others.

The danger of overfusing electrical circuits has been minimized through the use of standard fuses of correct amperage. Standard personal protection equipment has been adopted for the employees of the Authority.

The standardization program of the Authority not only promotes efficient operation but also facilitates the management of projects:

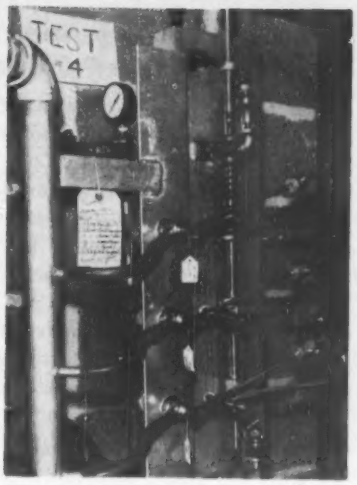
Savings Through Standards

(1) In the case of maintenance materials, a single standard permits the issuance of uniform job instructions for each project, resulting in economical use of such materials.

(2) Standardization of materials enables the procurement of larger quantities of fewer varities of items, thus achieving lower costs.

(3) Standards are being utilized as a medium to promote greater safety from fire hazards and occupational safety for employees.

(4) As a result of the standardization program, requirements for all the Authority's projects are consolidated. Such consolidated purchases enable each project storekeeper to gear his inventory and requisitioning to the adopted schedule, which is kept fairly uniform from year to year.



Faucet washers *for the Authority's projects are tested for service life.*

Many savings have resulted through the development of standard specifications. On elevator parts alone, according to the Authority, savings of over $5000 were made by obtaining competitive sources for various parts, at no sacrifice of quality. These savings are continuous, as these parts are repeatedly purchased year after year.

Purchases in 1953 amounted to $6,030,094 of which $5,417,498 were covered by standard specifications. The Authority estimates the percentage of savings due to standard specifications to be 15 percent. It is difficult to make this estimate of savings due to the wide variety of commodities purchased, and the fact that the savings vary greatly, depending on the degree of correction achieved through standards. On one commodity, disinfectant, the savings exceeded 50 percent; lesser savings are achieved on other items.

According to the Authority, the estimate of 15 percent savings in 1953 is a conservative one; it amounts to approximately $800,000.

Standardization is a good investment.

How Department of Defense Compiles Directory of Metalworking Machinery

The Directory of Metalworking Machinery was originally compiled in 1945 as part of the Standard Commodity Classification (SCC), issued by the Bureau of the Budget, Executive Office of the President. It lists machine tools and secondary metalworking and cutting machines (SCC categories 3410 and 3440) produced since 1920. A revision, to increase the scope of coverage, was published in 1947. The 1951 revision further increased the coverage, reflected changes in corporate structure and plant ownership, and included new manufacturers of metalworking machinery, and new models of machines produced since the 1947 revision. It also incorporated a five-digit code for designating the manufacturer, replacing the previously used four-digit code.

The First Addendum, issued in December 1952, supplements the list of manufacturers of metalworking machinery contained in the 1951 revision of the Directory. It lists the new (or previously unlisted) manufacturers and their metalworking machinery product reported since publication of the 1951 revision. It also lists manufacturers shown in that revision who have reported new machines not previously listed. A number of machines listed in the 1951 revision as being in current production have been discontinued; also, some machines shown in that revision as discontinued are again being manufactured. These changes of status are reflected in the Addendum.

The Second Addendum, issued in September 1953, lists new or previously unlisted domestic and foreign metalworking machinery manufacturers and their products reported since publication of the 1951 revision of the Directory and the First Addendum.

Machine Listings by Manufacturers. — Machine listing by manufacturers shows: (1) Machine description; (2) Manufacturers' model; (3) Size or capacity; (4) Standard Commodity Classification code; (5) Code for manufacturer; and (6) Machine model code.

Index. — An alphabetical listing of manufacturers of metalworking machinery shows a 5-digit code for the manufacturer and the Directory or Addendum page which contains the listing of the manufacturer's metalworking machinery product.

Code for Metalworking Machinery. — The code number for each metalworking machine consists of 17 digits: 10 digits for the Standard Commodity Classification, 5 digits for the manufacturer's code, and 2 digits for the machine model. For example, the Standard Commodity Classification code number for a Monarch Tool Company Model "KK" floor type engine lathe with a 12-inch swing and 54-in. center-to-center distance is 3416 31 12 10; the manufacturer's code — 41292, and the machine model code — 21; or 3416 31 12 10 41292 21 — a total of 17 digits.

Structure of the 17-digit code. The following diagram illustrates the structure of the 17-digit code.

The top section of the lower diagram illustrates the position of each Classification Subdivision, the Code for Manufacturer, and the Manufacturer's Machine Model Code in the 17-digits code number.

The lower section illustrates the exact meaning of the digits in each position by means of a specific example.

CLASSIFICATION SUBDIVISIONS →	MAJOR GROUP	CLASS	SUB-CLASS	TYPE	SUB-TYPE	PRIMARY SIZE GROUP	SECONDARY SIZE GROUP	SPECIFIC SIZE	CODE FOR MANUFACTURER	MANUFACTURER'S MODEL CODE
POSITION OF CODE DIGITS	1ST-2ND	3RD	4TH	5TH	6TH	7TH	8TH	9TH-10TH	11TH-15TH	16TH-17TH
EXAMPLE OF CODE	34	1	6	3	1	1	2	10	41292	21
MEANING OF CODE →	METALWORKING MACHINERY	MACHINE TOOLS	LATHES	HEAVY DUTY ENGINE LATHE	STANDARD	UNDER 16 IN. RATED SWING	54 IN. TO 102 IN. CC	12 IN. RATED SWING AND 54 IN. CC	MONARCH MACHINE TOOL COMPANY	MODEL "KK"

Major Groups in the Standard Commodity Classification. — The Directory and addenda list the following metalworking machinery:

I Standard Commodity Classification — Major Group 34 (Part I)

- 3411 Boring Machines
- 3412 Broaching Machines
- 3413 Drilling Machines
- 3414 Gear Cutting and Finishing Machines
- 3415 Grinding Machines
- 3416 Lathes
- 3417 Milling Machines
- 3418 Planers
- 3419 Miscellaneous Machine Tools (Including Shapers, Honing and Lapping Machines, Polishing and Buffing Machines, Sawing and Abrasive Cut-Off Machines, Filing Machines, and Tapping and Threading Machines)

II Standard Commodity Classification — Major Group 34 (Part IV)

- 3441 Bending and Forming Machines
- 3442 Hydraulic and Pneumatic Presses Table of Approximate Tonnage Capacities of Straight Sided Presses at Bottom of Stroke
- 3443 Mechanical Presses, Power Driven
- 3444 Manual Presses (Arbor, Straightening, Forcing and Assembly)
- 3445 Punching and Shearing Machines
- 3446 Forging Machinery and Hammers (not including Forging Presses)
- 3447 Wire and Metal Ribbon-Forming Machines (not including Roll Forming 3441 9600)
- 3448 Riveting Machines (not including Power-Driven Hand Riveting Machines)
- 3449 Miscellaneous Secondary Metal Forming and Cutting Machines (Thread Rolling, Marking, and Knurling)

Copies of the 1951 revision of the Directory of Metalworking Machinery (lxv plus 795 pages), the First Addendum (x plus 75 pages) and the Second Addendum (xii plus 52 pages), may be obtained from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. at $3.50, 45 cents, and 30 cents, respectively.

Questions pertaining to the Directory or the Addenda should be directed to the Office of the Secretary of Defense, Washington 25, D. C.

FROM OTHER COUNTRIES

Members of the American Standards Association may borrow from the ASA Library copies of any of the following standards recently received from other countries. Orders may also be sent to the country of origin through the ASA office. Titles are given here in English, but documents are in the language of the country from which they were received. An asterisk * indicates that the standard is available in English as well. For the convenience of readers, the standards are listed under their general UDC classifications. In ordering please refer to the number following the title.

645.4 FURNITURE AND ACCESSORIES

United Kingdom (BSI)

Domestic furniture constructed mainly of wood: Part 4: Bedstead ends — BS 1960:Part 4:1953

645.497 LADDERS

United Kingdom (BSI)

Aluminum alloy ladders, steps and trestles for the building and civil engineering industries — BS 2037:1953

646 CLOTHING

Czechoslovakia (CSN)

Ready-made outer clothing — CSN 80 7010

651.4/.7 OFFICE ADMINISTRATION

Finland (SFS)

Bill forms. Promissory notes — P.I.10
4-hole punch for loose leaves — Z.VIII.3

652 COMMERCIAL SCRIPT. COPYING WORK

Belgium (IBN)

Proofreaders' marks on written or typewritten manuscripts — NBN 288
Proofreaders' marks on galley proofs — NBN 287

656 TRANSPORT ORGANIZATION

Norway (NSF)

Transport analysis — symbols and forms — NS 809

658 ORGANIZATION OF WORK. INDUSTRY

Netherlands (HCNN)

Index figures for industrial injuries — V 3047

658.562 INSPECTION. QUALITY CONTROL

France (AFNOR)

Common terminology used in industrial practice for quality control — NF X 05-020

Japan (JISC)

General principles for sampling inspection procedures — JIS Z 9001
Single sampling inspection plans having desired operating characteristics — JIS Z 9002

659 ADVERTISING

Norway (NSF)

Poster sizes, boards, columns — NS 819

66 CHEMICAL INDUSTRY

France (AFNOR)

3 tests on cellulose — NF T 12-002/3, 12-005
Determination of pH of water with glass electrode — NF T 90-008

Germany (DNA)

12 standards for different chemical apparatus — DIN 28001/3, -28100/1, -28105, -28110, -28130/3, -28180

United Kingdom (BSI)

Winchester bottles — BS 830:1953
Symbols for use on flow diagrams of chemical and petroleum plants — BS 974:1953

661 CHEMICAL PRODUCTS IN THE NARROWER SENSE

Argentina (IRAM)

Concentrated sulfuric acid for industrial use — IRAM T088

Nationalist China (CNS)

Salt, refined — CNS 373-K109
DDT — CNS 374-K110
Camphor — CNS 375-K111
Bleaching powder — CNS 377-K113
Solvent oil — CNS 378-K114
Gypsum — CNS 379-K115
Calcium chloride, technical — CNS 380-K116
Lime, technical — CNS 381-K117

Czechoslovakia (CSN)

Potassium dichromate technical — CNS 65 2511

France (AFNOR)

Sulfuric acid — NF T 23-01
Chloric acid — NF T 23-02
Nitric acid — NF T 23-03

Israel (SII)

Hydrochloric Acid — SI 84
Sulfuric Acid — SI 85
Nitric Acid — SI 86

South Africa (SABS)

Standard specification for salt (8 types) — SABS 327/334 -1952

662.6/.9 FUEL. INDUSTRIAL HEATING

Belgium (NBN)

Domestic metallic stoves for solid fuel — NBN 301

France (AFNOR)

Solid fuel: densimetric classification and washability curves — NF M 03-016
Liquid fuel burners for domestic use — NF E 31-301
Terminology for hot-air heating installations — NF E 31-501

Germany (DNA)

3 test methods of liquid fuels — DIN 51769/70, -51772

United Kingdom (BSI)

Size analysis of coke — BS 2074:1954

663.6 WATER, DRINKING AND INDUSTRIAL

Netherlands (HCNN)

Bacteriological examination of drinking water — V 3043

664 PREPARATION AND PRESERVATION OF SOLID FOODSTUFFS

Czechoslovakia (CSN)

3 standards for starch and dextrine — CSN 56 6101, -6210, -6220

Israel (SII)

Sauerkraut — SI 96

Mexico (DGN)

Canned green figs — R 37
Ready made mustard — R 38

665.3 VEGETABLE OILS, FATS AND WAXES

Argentina (IRAM)

Determination of Viscosity by Saybolt method — IRAM 5506
Determination of unsaponifiable ingredients — IRAM 5517
Determination of Hydroxyl and Acetyl values — IRAM 5518
Determination of Bromide index — IRAM 5522
Determination of Reichert-Meisel and Polenske Indexes — IRAM 5524

665.4/.5 MINERAL OILS, FATS, WAXES

Czechoslovakia (CSN)

7 standards for different tests of motor fuel — CSN 65 6179, -6181, -6183, -6218/9, -6505/6

Israel (SII)

70-octane gasoline — SI 90
Kerosene oil for domestic use — SI 100

Japan (JISC)

Aviation gasoline — JIS K 2206
4 test methods for aviation fuel — JIS K 2276/9

Mexico (DGN)

Hydraulic brake liquid — R 26

Netherlands (HCNN)

Determination of acid and basic value by color-indicator titration — N 3025
Determination of artificial aging of steam-turbine-oils containing inhibitors — V 3024

Switzerland (SNV)

Sampling liquid petroleum products — SNV 81040

United Kingdom (BSI)

Tubular heat exchangers for use in the petroleum industry — BS 2041:1953

673.4 ELECTROPLATED PRODUCTS

South Africa (SABS)

Standard specification for electroplated nickel silver articles for domestic and hotel use — SABS 96-1953

676 PAPER INDUSTRY

Argentina (IRAM)

3 standards for testing paper and cardboard — IRAM 3016/7, -3020
Mimeograph paper — IRAM 3021

Ireland (IIRS)

Wallpaper base — IS 55
Finished wallpaper — IS 56

United Kingdom (BSI)

Paper toweling and dispensing cabinets — BS 1439:1954

International Technical Meetings

Subject	ISO/TC	Place	Date
			June
Pipes and fittings/Gas list tubes and other steel pipes	5/SC 1	Dusseldorf	1-4
Textiles/Colorfastness tests	38/SC 1	Scarborough (England)	4, 5, 7
Textiles/Shrinkage of fabrics in washing	38/SC 2	Scarborough (England)	12
Documentation/Documentary reproduction	46/SC 1	Brussels	10-12
Documentation	46	Brussels	14-16
Pallets for unit load method of materials handling	51	London	21-23
Unification of boiler codes/ Strength of pressure parts	11/SC 2	Paris	21-26
			July
Preferred numbers	19	Paris	1-3
Standing committee for the study of scientific principles of standardization	STACO	Cologne	8, 9
			Oct
Plastics	61	Brighton (England)	4-8
Mica	56	Paris	21-22

MEETINGS PLANNED

(Final dates not yet decided)

Safety colors	80	The Hague	Sept
Aromatic hydrocarbons	78		Autumn
Lac	50	London	Oct 11-13
Terminology	37	Vienna	Oct 13-16
Essential oils	54	London	Oct 18-20
Small tools	29	Paris	Oct 25-28
Laboratory glassware and related apparatus	48	London	Oct 25-29
Hermetically sealed metal food containers	52	Lisbon	Nov 3-5
Automobiles/Agricultural tractors	22T	Lisbon	Nov 10-13
Agricultural machines	23	Lisbon	Nov 15-17
Welding/Welding structure calculations	44/SC 2	Brussels	Nov 25-27
Welding/Filler materials and electrodes	44/SC 3	Paris	Nov or Dec
Cast iron	25		Nov or Dec
Gears	60	Brussels	Dec 8-10
Gas cylinders	58		Late 1954
			1955
Aircraft	20	Italy	April or May
Unification of boiler codes	11	Madrid	May 2-14
Solid mineral fuels	27		May

SAE Plans 50th Anniversary

The Society of Automotive Engineers celebrates its fiftieth anniversary in 1955. In planning its celebration the SAE is attempting to avoid conflicts with anniversary celebrations of other organizations. The Society has asked ASA, therefore, whether companies or member organizations associated with ASA are celebrating a 25th, 50th, 75th, or 100th anniversary during 1955. In some cases, the Society points out, it might be mutually desirable to tie in the SAE celebration with theirs, if only to the extent of a friendly salute in their direction.

So far the following meeting dates have been approved by the SAE Council: —

January 10-14, 1955
Golden Anniversary Annual Meeting
The Sheraton-Cadillac Hotel and Hotel Statler, Detroit, Mich.

June 12-17
Golden Anniversary Summer Meeting
Chalfonte-Haddon Hall, Atlantic City, N. J.

October 31-November 2
Golden Anniversary Transportation Meeting
The Chase, St. Louis, Mo.

November 9-10
Golden Anniversary Fuels and Lubricants Meeting
The Bellevue-Stratford, Philadelphia, Pa.

• • **Gilbert E. Morris,** Superintendent of Building of Los Angeles, was recently elected head of the Pacific Coast Building Officials Conference. The Conference, which issues the widely used "Uniform Building Code," is represented on ASA's Construction Standards Board and on 12 sectional committees working on building and safety standards.

International Recommendation On Electrical Capacitors

A new international recommendation for electrical capacitors, which combines safety with performance, has been released by the International Electrotechnical Commission.

The recommendation contains safety rules and tests for capacitors for connection to a-c low and high voltage systems with a frequency up to 100 cycles per second. It pertains to capacitors used for power factor correction, for coupling with other electric systems, for over-voltage protection, and other low-frequency a-c applications.

The publication applies to both capacitor units and assemblies that form complete units.

A special feature of the IEC publication is the list of identifying terms and definitions. Tests are divided into two main classes:

1. Those for capacitors used with all terminals insulated from earth during normal service.
2. Those for capacitors used with one terminal permanently earthed.

Copies of the 17-page booklet (No. 70-1) may be obtained from the American Standards Association at $1 per copy.

WHAT IS YOUR QUESTION?

What does the designation 2.3d x 20 l mean with regard to wood screws?

This is a German designation, referring to a screw of 20-mm length with a shank diameter of 2.3 mm.

My company has branches in Europe. Is there any place in Europe where they can buy American Standards?

The national standards body in each country has a complete file of American Standards and acts as a sales agent for them.

Are there Federal Government standards for storage batteries?

There are some 24 standards, including Air Force, Navy, Army, and Federal Specifications, on storage batteries — 3 Federal Specifications, 7 Navy standards, 4 Army standards, and 10 Air Force standards.

In order to inspect and overhaul the many types of machine tools that have come to this military air base, we have attempted to find inspection standards that would apply. Your standard for lathes is very satisfactory. Where can I obtain similar standards for different types of milling machines, boring mills, grinders, shapers, planers, slotting machines, drill presses, punch presses, lathes, and chucks?

American Standard B5.16-1952, Efficiency of Engine Lathes, is the only standard of its kind. Neither Sectional Committee B5 nor the National Machine Tool Builders Association has developed standards of this type for the machines listed.

Are there American Standards for baseball bats, particularly those used for high school soft ball baseball games?

There are no American Standards for baseball bats, but the Encyclopedia Britannica has certain specifications: "A softball bat shall not be more than 34 in. in length and not more than 2⅛ in. in diameter at its largest part. A baseball bat shall not be more than 42 in. in length and not more than 2¾ in. in diameter."

Are there American Standards for major home appliances?

American Standards affecting such appliances include the following:

Method of Computing Food-Storage Volume and Shelf Area of Automatic Household Refrigerators, B38.1-1944

Test Procedures for Household Electric Refrigerators (Mechanically Operated), B38.2-1944

Methods of Testing Frequency Modulation Broadcast Receivers, with Supplement, Effects of Mistuning and Downward Modulation, C16.-12-1949; C16.12a-1951

Methods of Testing Television Receivers (Monochrome Service, 6-Megacycle Channel), C16.13-1949

(These last two are also Institute of Radio Engineers' standards, 47 IRE 17.S1; 49 IRE 17.S1; and 48 IRE 22.S1)

Power-Operated Radio Receiving Appliances, C65.1-1952

Household Automatic Electric Flatirons, C70.1-1953

Household Electric Ranges, C71.1-1950

Household Automatic Electric Storage-Type Water Heaters, C72.1-1949

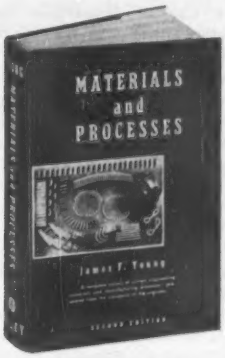
(These three are approved standards of the National Electrical Manufacturers Association, NEMA DA1-1954; NEMA ER1-1950; NEMA WH1-1949)

Dimensions, Tolerances, and Terminology for Home Cooking and Baking Utensils, Z61.1-1949

Approval and Installation Requirements for Gas-Burning Appliances, Z21

(A series of 37 American Standards for all types of gas-burning appliances includes 31 for home appliances, equipment, and accessories. These standards are the basis for tests carried out by the American Gas Association for the use of its AGA Seal of Approval.)

The
ENGINEER'S
Point of View on



SECOND EDITION

MATERIALS and PROCESSES

By JAMES F. YOUNG
General Electric Company

This is the only work that covers both materials and processes from the engineer's point of view.

It retains the outlook and philosophy that made the first edition so popular but is now expanded by 50% to include these important features:

- New information on nonmetallic materials, constructional materials, and processes.
- Up-to-date coverage of developments in physical metallurgy and chemistry.
- Added material on property data and process tolerances.
- New chapters on metallographic examination, structure and properties of nonmetallic materials; rubber, ceramics, porcelain, and glass; and statistical methods used in quality control.
- Latest information on heat treatment, tarnishings, electrical contacts and superalloys.

1954 1014 pages Illus. $8.50

For Sale By:

The MAGAZINE of STANDARDS
70 East 45th Street
New York 17, N. Y.

Announcing New Books . . . .

• **Machinery's Handbook.** By Erik Oberg and Franklin D. Jones. 15th Edition. (The Industrial Press, 148 Lafayette St., New York 13, N. Y. 1954. 1911 pp. $9.00)

• **The Use of Handbook Tables and Formulas.** (216 pp. $1.50, with Handbook, $10.50)

Over 1,000,000 copies of MACHINERY'S HANDBOOK have been printed in fourteen editions since it first appeared in 1914. The new fifteenth edition makes available the recent and basic information, data, and formulas that the handbook user in the mechanical field needs to keep abreast of current developments.

Of particular interest in the fifteenth edition are a revised and rearranged spur gear section and an entirely new section on generated bevel gears. Featured in the spur gear section is a greatly enlarged presentation of standard definitions and terms; formulas and tabulated data for readily determining the dedendums and root diameters for hobbing and shaping pre-shaved gears; full data and information on fine-pitch spur gears, including tolerances for gear blanks, and data for enlarged pinions; and recommendations and tabulated data for obtaining the proper amount of backlash in various types of gears.

In the bevel gear section, the various types of bevel gears and their applications are described. A detailed presentation of the revised Gleason system of straight and bevel gears is included with formulas, charts, and step-by-step procedures for designing bevel gears for durability and strength. In addition, there are formulas and methods for determining thrust and radial loads, and a table of recommended bevel gear materials.

A new section on fine-pitch worms and wormgears has been added in which the step-by-step design procedure is outlined and formulas are given for obtaining profile and pressure angle corrections for cutters and grinding wheels used to produce fine-pitch worms.

Important changes in the dimensions of American Standard square and hexagon bolts and nuts are summarized, with a table comparing the old and new across-flats dimensions. Complete tables giving the standard sizes and limiting dimensions of the various types of nuts and bolts are also included.

Thread classes, thread form, allowances, tolerances, limiting dimensions, and preferred thread series of the American Standard General-purpose Acme and Stub Acme screw threads are given in the extensive and detailed screw thread section.

The section on ball, roller, and needle bearings is completely new and gives in considerable detail and scope the descriptions, designations, ranges of standard sizes, boundary dimensions, and tolerances for standard anti-friction bearings.

The new milling cutter section now gives extensive tables of dimensions and tolerances covering the various types of American Standard milling cutters, together with a table showing four types of set-ups for grinding clearance angles on milling cutter teeth.

Standard dimensions of tool shanks, toolpost openings, lathe center heights, types of standard toolposts, lengths of solid square and rectangular tools, and dimensions and commercial catalog numbers of sintered-carbide tips for single-point tools are an important part of the small cutting tools section.

Additions to the section on honing include formulas and data for determining the proper rotative speeds, recommended tolerances, allowances for stock removal, and possible adjustments for eliminating undesirable conditions. In the materials section, new data on nickel and nickel alloys, titanium and titanium alloys, and copper-silicon and beryllium alloys are presented.

Recent Publications Received from ASA Members

American Society for Testing Materials

1916 Race Street, Philadelphia 3, Pa.

• **Tentative Specifications for Corrosion-Resisting Chromium and Chromium-Nickel Steel Welding Rods and Bare Electrodes** (ASTM A 371; AWS A5.9) 25¢

Issued jointly by ASTM and the American Welding Society, these are the first specifications covering stainless steel filler metals for use with the inert-gas metal-arc process. A table gives the chemical analysis of the different classifications for verifying conformity of a given filler metal to the standard requirements. Standard sizes and lengths and packaging requirements are given.

Instrument Society of America

1319 Alleghany Avenue, Pittsburgh 33, Pa.

• **1953 Proceedings of the Instrument Society of America.** 340 pp. $10 to nonmembers.

Contains 74 technical papers presented before the Eighth National Instrument Conference, Chicago, September 21-25, 1953. Included are papers on instrumentation for production processes, testing instrumentation, instrument operation and maintenance, physical properties measurement, aeronautical instrumentation, instrumentation for transportation, medical instrumentation, geophysical instrumentation, and process control instrumentation. Papers delivered at the panel discussion on "Instrumentation in Research and Development — The Fundamentals" are also included. Everett S. Lee, General Electric Company; C. S. Draper, Massachusetts Institute of Technology; E. P. Felch, Bell Telephone Laboratories; W. G. Brombacher, National Bureau of Standards; C. F. Lucks, Battelle Memorial Institute; and Taylor G. Fletcher, Beckman Instruments, Inc, took part.

National Electrical Manufacturers Association

155 East 44th Street, New York 17, N. Y.

• **Standards for Mining Belt Conveyors, No. MB1-1954.** 16 pp. $1.50.

These standards apply to sectional-type electrically driven troughed belt conveyors commonly used in mines above and below ground and to direct-current motors and three -phase 60-cycle squirrel-cage induction motors used to drive such conveyors. A section is included for electric controls, and the terms used throughout the standards are defined.

• **Standards for Black Varnished Glass Fabric, No. VF6-1954.** 12 pp. $0.75.

• **Standards for Yellow Varnished Glass Fabric, No. VF7-1954.** 12 pp. $0.75.

Each of these books contain information concerning the testing, dimensions, physical and electrical properties, manufacturing, packing, and marking of varnished glass fabric.

• **NEMA Standard for Arc-welding Electrode Identification, Publication No. EW2-1954.** (70¢ per copy)

The tables in this publication identify arc-welding electrodes by the use of colors. They are based on a color system which permits the assignment of colors to new electrodes. The location of color markings is illustrated.

National Fire Protection Association

60 Batterymarch Street, Boston 10, Mass.

• **NFPA Handbook of Fire Protection** (Crosby - Fiske - Forster). 11th Edition. Edited by Robert S. Moulton. 5 x 7½ in. 1656 pp. $10.50.

This edition presents essential information on fire prevention and protection that time has crystallized into good practice. It covers both life safety from fire and protection of property. The Handbook is the only reference volume of its kind available today. It represents two-years' work on the part of the National Fire Protection Association staff with the assistance of more than 100 expert consultants. Since the last edition, new material is included on the following: Automatic spray sprinklers; new chemicals included in tables of flammable liquids and hazardous chemicals; flame spreading characteristics of interior finish materials; tables on fire resistance ratings of walls, floors, roofs, and columns; tables of fire hazard properties of plastics and new extinguishing agents.

Pipe Fabrication Institute

813 Clark Building, Pittsburgh 22, Pa.

• **Pressure-Temperature Ratings of Plain End Pipe Used in Power Plant Piping Systems.** TB1-1953. 28 pp. $1.00.

Tables of pressure-temperature ratings of pipe commonly used in power plant piping systems within the scope of Section 1 of the Code for Pressure Piping, ASA B31.1-1951, and Section 1 of the ASME Boiler and Pressure Vessel Code on Power Boilers. The allowable stress values used are those permitted by all revisions and addenda to these codes in effect June 1, 1953.

AMERICAN STANDARDS

Status as of May 18, 1954

Legend

Standards Council—Approval of Standards Council is final approval as American Standard; usually requires 4 weeks.

Board of Review — Acts for Standards Council and gives final approval as American Standard; action usually requires 2 weeks.

Standards Boards — Approve standards to send to Standards Council or Board of Review for final action; approval by standards boards usually takes 4 weeks.

Building

American Standards Published —

Portland Cement, Specifications for, ASTM C150-53; ASA A1.1-1954 (Revision of ASTM C150-49; ASA A1.1-1950) $0.25

Methods of Test for Compressive Strength of Hydraulic Cement Mortars, ASTM C109-52; ASA A1.4-1954 (Revision of ASTM C109-49; ASA A1.4-1950) $0.25

Methods of Test for Heat of Hydration of Portland Cement, ASTM C186-53; ASA A1.10-1954 (Revision of ASTM C186-49; ASA A1.10-1950) $0.25

Method of Test for Time of Setting of Hydraulic Cement by Gillmore Needle, ASTM C266-51T; ASA A1.17-1954 $0.25

Drain Tile, Specifications for, ASTM C4-50T; ASA A6.1-1954 (Revision of ASTM C4-24; ASA A6-1925) $0.25

Sewer Brick (Made from Clay or Shale), Specifications for, ASTM C32-50; ASA A100.1-1954 $0.25

Vitrified Filter Block for Trickling Filters, Specifications for, ASTM C159-51; ASA A102.1-1954 $0.25

Chemical-Resistant Masonry Units, Specifications for, ASTM C279-52T; ASA A103.1-1954 $0.25

Definitions of Terms Relating to Structural Clay Tile, ASTM C43-50; ASA A104.1-1954 $0.25

Gypsum Partition Tile or Block, Specifications for, ASTM C52-41; ASA A105.1-1954 $0.25

Standard Strength Perforated Clay Pipe, Specifications for, ASTM C211-50; ASA A106.1-1954 $0.25

Methods of Test for Time of Setting of Hydraulic Cement by Vicat Needle, ASTM C191-52; ASA A1.15-1954 (Revision of ASTM C191-49; ASA A1.15-1950) $0.25

Air-Entraining Portland Cement, Specifications for, ASTM C175-53; ASA A1.16-1954 (Revision of C175-48T; ASA A1.16-1950) $0.25

Method of Test for Penetration of Bituminous Materials, ASTM D5-52; ASA A37.1-1954 (Revision of ASTM D5-49; ASA A37.1-1951) $0.25

Method of Test for Bitumen, ASTM D4-52; ASA A37.3-1954 (Revision of ASTM D4-42; ASA A37.3-1943) $0.25

Method of Test for Abrasion of Coarse Aggregate by Use of the Los Angeles Machine, ASTM C131-51; ASA A37.7-1954 (Revision of ASTM C131-47; ASA A37.7-1948) $0.25

Method of Test for Distillation of Tars and Tar Products, ASTM D20-52; ASA A37.9-1954 (Revision of ASTM D20-30; ASA A37.9-1943) $0.25

Method of Test for Slump of Portland-Cement Concrete, ASTM C143-52; ASA A37.29-1954 (Revision of ASTM C143-39; ASA A37.29-1948) $0.25

Method of Sampling Fresh Concrete, ASTM C172-52T; ASA A37.30-1954 (Revision of ASTM D172-44; ASA A37.30-1948) $0.25

Definitions of Terms Relating to Materials for Roads and Pavements, ASTM D8-52; ASA A37.33-1954 (Revision of ASTM D8-49; ASA A37.33-1951 $0.25

Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method, ASTM C231-52T; ASA A37.70-1954 (Revision of C231-49T; ASA A37.70-1951) $0.25

Method of Test for Specific Gravity of Road Oils, Road Tars, Asphalt Cements, and Soft Tar Pitches, ASTM D70-52; ASA A37.71-1954 (Revision of ASTM D70.27; ASA A37.71-1951) $0.25

Method of Test for Specific Gravity of Asphalts and Tar Pitches Sufficiently Solid to be Handled in Fragments, ASTM D71-52; ASA A37.72-1954 (Revision of ASTM D71-27; ASA A37.72-1951) $0.25

Sponsor: American Society for Testing Materials

Chemical Industry

In Miscellaneous Standards Board —

Pure Para Red Toner, Light, Specifications for, ASTM D475-49; ASA K49.1 (Revision of ASTM D475-41; ASA K49-1941)

Method of Test for Acetone Extract in Black Pigments, ASTM D305-51; ASA K55.1 (Revision of ASTM D305-31; ASA K55-1941)

Methods for Chemical Analysis of Yellow, Orange and Green Pigments, Containing Lead Chromate, and Chromium Oxide Green, ASTM D126-50T; ASA K58.1 (Revision of ASTM D126-36; ASA K58-1941)

Sponsor: American Society for Testing Materials

Consumer

In Board of Review —

Methods of Testing Felt, ASTM D461-53; ASA L14.52 (Revision of ASTM D461-51; ASA L14.52-1953)

Sponsor: American Association of Textile Chemists and Colorists; American Society for Testing Materials

Milled Toilet Soap, Specifications for, ASTM D455-53T; ASA K60.6 (Revision of ASTM D455-48; ASA K60.6-1949)

Sponsor: American Society for Testing Materials

In Consumer Goods Standards Board—

Definitions of Terms in Relation to Textile Materials, ASTM D123-53; ASA L14.12 (Revision of ASTM D123-52; ASA L14.12-1953)

Sponsor: American Association of Textile Chemists and Colorists; American Society for Testing Materials

Withdrawal being considered —

Osnaburg Cement Sacks, Specifications and Methods of Test for, ASTM D205-39; ASA L14.15-1949

Woolen Yarns, Specifications and Methods of Test for, ASTM D403-48T; ASA L14.21-1949

Worsted Yarns, Specifications and Methods of Test for, ASTM D404-48T; ASA L14.22-1949

Sponsors: American Association of Textile Chemists and Colorists; American Society for Testing Materials

Electrical

American Standards Published —

Guide for Preferred Voltage Ratings for A-C Systems and Equipment, EEI R-6; NEMA 117, C84.1-1954 $0.70

Sponsors: Edison Electric Institute; National Electrical Manufacturers Association

Methods of Testing Shellac Used for Electrical Insulation, ASTM D411-52; ASA C59.18-1954 (Revision of C59.18-1945) $0.25

Covers tests for shellac, both in the dry and powdered forms, to be used for electrical insulating purposes.

Natural Block Mica and Mica Films Suitable for Use in Fixed Mica-Dielectric Capacitors, Specifications for, ASTM D748-52T; ASA C59.26-1954 (Revision of C59.26-1951) $0.25

Covers natural block mica and mica films suitable for use in the manufacture of fixed mica-dielectric capacitors. In addition, contains a system of classifying the quality of natural block mica and mica films based on a combination of electrical and physical properties which the mica must possess.

Sponsor: American Society for Testing Materials

American Standards Approved —

Flexible Cord and Fixture Wire, C33.1-1954 (Revision of C33.1-1953)

Covers the requirements for flexible cord and fixture wire, except armored cords, for use in accordance with the American Standard National Electric Code, C1. This American Standard is the same as the Underwriters' Laboratories' standard of the same name, except that ASA approval does not cover paragraphs 5 and 6, and 386 to 480, incl., of the UL publication.

Contains complete requirements and tests for flexible cords and single-conductor fixture wires made of 21 different classes of insulating material.

Sponsor: Underwriters' Laboratories, Inc.

Requirements and Test Code for Instrument Transformers, C57.13-1954 (Consolidation of C57.13-1953 and C57.23-1948)

Sponsor: Westinghouse Electric Corporation

American Standards Reaffirmed —

Color Codes: Numerical Values, Decimal Multipliers and Tolerances for Components for Electronic Equipment, C83.1-1954 (Reaffirmation of C16.14-1949)

Preferred Values for Components for Electronic Equipment, C83.2-1954 (Reaffirmation of C16.15-1949)

Terminology for Piezoelectric Crystals, C83.3-1954 (Reaffirmation of C16.17-1951)

Sponsor: Radio-Electronics-Television Manufacturers Association

American Standard Withdrawn —

Test Code for Instrument Transformers, C57.23-1948

Sponsor: Westinghouse Electric Corporation

Withdrawal being considered —

Power and Audio Transformers and Reactors (Home Receiver Replacement Type), C16.9-1943

Sponsor: Institute of Radio Engineers

Mechanical

American Standards Approved —

Double-Pitch Power Transmission Roller Chains and Sprockets, B29.3-1954

Double-Pitch Conveyor Roller Chains, Attachments and Sprockets, B29.4-1954

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

In Board of Review —

Attachments for Transmission Roller Chains, B29.5

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

Motion Pictures

In Board of Review —

35-mm Sound Motion Picture Film Usage in Camera, PH22.2 (Revision of Z22.2-1946)

35-mm Sound Motion Picture Film Usage in Projector, PH22.3 (Revision of Z22.3-1946)

Dimensions for 8-mm Motion Picture Film, PH22.17 (Revision of Z22.17-1947)

Dimensions for 35-mm Motion Picture Positive Raw Stock, PH22.36 (Revision of Z22.36-1947)

Slides and Opaques for Television Film Camera Chains, PH22.94

Sponsor: Society of Motion Picture and Television Engineers

Office Equipment

In Miscellaneous Standards Board —

Maximum Electrical Leakage of Dictating Machines, X2.5.17/234

Length of Cables for Office Dictation Machines, X2.5.19

Non-Carbonized, Single-Ply, Adding Machine Paper Rolls, Specifications for, X2.4.2

Definition of Posture Chair, X2.1.4/238

Operating Voltage Range of Office Dictating Equipment, X2.5.16/232

Sponsor: National Office Management Association

Photography

American Standards Published —

Designation for Thickness of Photographic Paper, PH1.1-1954 (Revision of Z38.1.44-1944) $0.25

Temperature for Photographic Processing Solutions, PH4.5-1954 (Revision of Z38.8.1-1944) $0.25

Method for Converting Weights and Measures for Photographic Use, PH4.6-1954 (Revision of Z38.8.2-1945) $0.25

Method for Determining the Thiosulfate Content of Processed Photographic Film, PH4.8-1954 $0.25

Photographic Grade Sodium Thiosulfate, Anhydrous $Na_2S_2O_3$, (Anhydrous Hypo), Specification for, PH4.250-1954 (Revision of Z38.8.250-1949) $0.25

Photographic Grade Sodium Thiosulfate, Crystalline, $Na_2S_2O_3 \cdot 5H_2O$, (Crystal Hypo), Specifications for, PH4.251-1954 (Revision of Z38.8.251-1949) $0.25

Photographic Grade Ammonium Thiosulfate, 60 Percent Solution, $(NH_4)_2S_2O_3$, (Ammonium Hypo Solution), Specification for, PH4.252-1954 $0.25

Dimensions for Molded-Type Cores for Photographic Film and Paper Rolls, PH1.13-1954 (Revision of Z38.1.48-1947) $0.25

Dimensions for 35-mm Film Magazines for Still Picture Camera, PH1.14-1954 Revision of Z38.1.47-1946) $0.25

Dimensions for Industrial X-ray Sheet Film (Inch Sizes), PH1.15-1954 (Revision of Z38.1.25-1947) $0.25

Dimensions for Graphic Arts Sheet Film (Inch Sizes), PH1.16-1954 (Revision of Z38.1.26-1947) $0.25

Dimensions for Medical X-ray Sheet Film (Inch and Centimeter Sizes), PH1.17-1954 (Revision of Z38.1.27-1947) $0.25

Dimensions for Professional Portrait and Commercial Sheet Film (Inch Sizes), PH1.18-1954 (Revision of Z38.1.28-1947) $0.25

Photographic Grade Ammonium Thiosulfate, $(NH_4)_2S_2O_3$, (Ammonium Hypo), PH4.253-1954 $0.25

Sponsor: Photographic Standards Board

In Board of Review —

Method for Indicating the Stability of the Images of Processed Black-and-White Films, Plates, and Papers, PH4.12 (Revision of Z38.8.17-1948)

Method for Determining the Chemical Resistivity and Photographic Inertness of Constructional Materials for Processing Equipment, PH4.13

Photographic Grade Citric Acid, Anhydrous, Specification for, PH4.107

Photographic Grade Sodium Bromide, Specification for, PH4.207

Sponsor: Photographic Standards Board

In Miscellaneous Standards Board —

Dimension for 70-mm Perforated Film for Cameras Other Than Motion Picture Cameras. PH1.20

Photographic Grade Sodium Tetraborate, Decahydrate, (Borax), Specification for, PH4.230 (Revision of Z38.8.230-1948)

Method for Determining Spectral-Sensitivity Indexes and Group Numbers for Photographic Emulsions, PH2.6 (Revision of Z38.2.4-1946)

Photographic Grade Sodium Metaborate, Octahydrate, Specification for, PH4.231

Photographic Grade Sodium Tetraborate, Pentahydrate, Specification for, PH4.233

Sponsor: Photographic Standards Board

Rubber Industry

American Standards Published —

Method of Test for Accelerated Aging of Vulcanized Rubber by the Oxygen-Pressure Method, ASTM D572-52; ASA J4.1-1954 (Revision of J4.1-1953) $0.25

Method of Test for Accelerated Aging of Vulcanized Rubber by the Oven Method, ASTM D573-52; ASA J5.1-1954 (Revision of J5.1-1953) $0.25

Sponsor: American Society for Testing materials

Safety

American Standard Approved —

Method of Marking Portable Compressed Gas Containers to Identify the Material Contained, Z48.1-1954 (Revision of Method of Marking Compressed Gas Cylinders to Identify Content, Z48.1-1942)

Marking for the identification of contents of portable compressed gas containers, not exceeding 1000 pounds water capacity. Additional markings, including international chemical formula or containers for use in international trade.

Sponsor: Compressed Gas Association

PLEASE CORRECT YOUR CHART

As published on page 153 (The Mag of Stds, May 1954), the chart showing use of the American Standard Safety Code for Grinding Wheels in State Requirements, shows information exactly opposite to that intended. The difficulty is due to transposition of two lines in the explanatory legend.

The correct legend is given below. It can be cut out and pasted over the incorrect legend. Or you may write to the American Standards Association for a copy of the correction for this purpose.

LEGEND

Less restrictive than ASA Standard

Same as or very similar to ASA Standard

What's New on American Standard Projects

Small Tools and Machine Tool Elements, B5 —

Sponsors: National Machine Tool Builders Association; Metal Cutting Tool Institute; Society of Automotive Engineers; The American Society of Mechanical Engineers.

C. J. Oxford, Chief Engineer, National Twist Drill & Tool Company, was recently named chairman of Technical Committee 20 on Reamers. This technical committee is in process of reorganization. A number of suggestions have been received for revising the 1949 edition of the American Standard on Reamers. When definite proposals are available, a meeting of the Technical Committee will be called to consider them.

Why Not Use Machine Tapers — *American Standard B5.10-1953?*

by *B. P. Graves,* Brown and Sharpe Mfg Company, Past Chairman, Technical Committee No. 3

The first edition of this taper standard was in process for several years — in fact, from September 1926 to March 1937, when ASA gave its approval to the first standard.

A subgroup was appointed in December 1932 to develop a Steep Taper Standard. This subgroup reported in December 1939 a series of six preferred and six intermediate steep tapers. This steep taper series has become the standard among the Milling Machine Industries and is being used quite extensively abroad — it has proven an economical proposition for industry.

Another subgroup was appointed in December, 1938, to revise the portion of the standard dealing with the self-holding taper series. This work was completed and reviewed in December 1941, and after approval of the sponsor bodies, was presented to ASA with recommendation that it be approved as American Standard. This approval was given in October 1943.

Again, in June 1949, the standard was reaffirmed as American Standard. Still another review was undertaken in 1952 and some minor changes were made; again the standard was approved by the sponsor bodies. This series was given the designation ASA B5.10-1953 on March 30, 1953.

I have outlined the amount of time, labor, and expense that have gone into this standard, showing that the sponsor bodies have on several occasions approved the standard. Yet, at this late date, we find new-design machines coming on the market, ignoring the self-holding taper series in whole or in part.

This situation has been the cause of much concern, correspondence, and telephone calls from users, who ask why machine tool builders are still using the old taper standards. In the case of the hold-back standard, many builders are still using a standard of their own, creating considerable confusion and difficulty in tooling machine tools.

This has brought the situation to a point where we are now being asked — if the standard is not to be used, why not discard it? Some large users have threatened to create a standard of their own in order to obtain economy in tooling, which is so necessary today. Solving this economy problem was the main purpose behind the standard. As it is the American Standard Self-Holding and Steep Series (and is being seriously considered as an International Recommendation), it would seem that by this time the merits of this standard should be fully appreciated and more generally accepted. Comments or suggestions as to how the standard can be put into full use for the benefit of all branches of American industry will be welcomed.

Code for Pressure Piping, B31 —

Sponsor: The American Society of Mechanical Engineers.

INTERPRETATIONS
Submitted by the Sponsor

From time to time certain actions of Sectional Committee B31 will be published for the information of those interested. While these do not constitute formal revisions of the Code, they may be utilized in specifications, or otherwise, as representing the considered opinion of the committee.

Pending revision of the Code for Pressure Piping, American Standard B31.1-1951, the sectional committee has recommended that the American Society of Mechanical Engineers, as sponsor, publish selected interpretations so that industry may take immediate advantage of corresponding proposed revisions.

Case No. 13
(Reopened)

Inquiry: What is the status of the "Report of the Task Force on Flexibility, February 25, 1954," as it relates to the previous Report of May 4, 1953 and Paragraph 620 in the 1951 Edition of the Code for Pressure Piping?

Reply: It is the opinion of the committee that in view of the fact that the February 25, 1954 Report is the final opinion of the Task Force on Flexibility, until the new 1955 Edition of the Code for Pressure Piping is published revising Paragraph 620, the new February 25, 1954 Report should be used in designing any new projects.

For designs already completed and those in progress, any one of the following procedures will meet the intent of the Code as it applies to piping flexibility:

(*a*) Follow the present wording of the Code, Paragraph 620.

(*b*) Follow the proposed revised wording given in the "Report of Task Force on Flexibility, May 4, 1953."

(*c*) Follow the proposed wording in the above Task Force Report, except using the alternate paragraphs contained in the report.

Case No. 15

Inquiry: May the new American Standard B16.5-1953 pressure-temperature rating tables be used in the various sections of the Code for Pressure Piping where reference is now made to "applicable American Standard" or to "ASA B16e?"

Reply: It is the committee's opinion that pending the new edition of the Code for Pressure Piping the pressure-temperature rating tables in American Standard B16.5-1953 may be used for all sections of the Code.

Sheet and Wire Gages, B32 —

Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers.

On recommendation of Sectional Committee B32, the American Standards Association has become a fully participating member of the international committee on sheet and wire gages, ISO/TC 62. The American Standard, Preferred Thicknesses for Uncoated Thin Flat Metals (Under 0.250 in.), B32.1-1952, has been submitted to the ISO committee as an American proposal for an ISO recommendation.

Transformers, Regulators, and Reactors, C57 —

Sponsor: Electrical Standards Board

The latest in the series of standards being developed by this sectional committee was approved by the American Standards Association this year — the American Standard for Transformers (67,000 volts and below, 501 through 10,000 Kva 3-phase, 301 through 5,000 Kva 1-phase), C57.12a-1954. There are now 14 American Standards in this series.

The committee still has a great deal of work under way.

Comments and suggestions are being collected on two Proposed American Standards which have been issued for trial use. These are the Proposed American Standards for Distribution Transformers, Conventional Subway Type, C57.19, and Proposed American Standard for Distribution Transformers, Overhead Type, C57.20. Both were originally developed by the EEI-NEMA Joint Committee on Standards for Distribution Transformers. Comments are being forwarded to the Joint Committee for use in preparing a new edition to be submitted to ASA for approval as American Standard.

A general revision of the temperature tests in the American Standard Test Code for Distribution, Power, and Regulating Transformers, C57.22-1948, has been completed by the subcommittee in charge, and is to be voted on by the sectional committee. A revision of the American Standard for Current Limiting Reactors, C57.16-1948, has also been approved by the subcommittee. Revisions of dielectric tests affecting American Standards C57.11-1953 and C57.22-1948 are also being completed.

The subcommittee on Guides for Loading is working on a revision of the Guide for Loading Step-Voltage and Induction-Voltage Regulators published as an appendix to the American Standards on Transformers, C57, as a source of engineering information. The subcommittee also has under active consideration a new Application Guide for Grounding for Instrument Transformer Secondary Circuits and Cases.

Plans are under way to include the electrical characteristics for bushings in classes 23 to 69 kv, inclusive, as a revised Table 8 in American Standard C57.12a-1954. These electrical characteristics for bushings are also being considered by Sectional Committee C37 on Switchgear.

Work will be started soon on a revision of American Standard for General-Purpose Specialty Transformers, C57.17-1948.

The committee reports that progress is being made on standards covering transformers with load tap changing equipment similar to American Standard C57.12-1949.

Sectional Committee C57 has also reviewed a number of international proposals and its comments have been forwarded to the secretaries for technical committees of the International Electrotechnical Commission on specifications for instrument transformers, impulse voltage tests, and power transformers.

Frogs, Switches, and Turnouts for Coal Mine Tracks, M7 —

Sponsor: American Mining Congress.

Standards for heavy rail turnouts are being studied by a subcommittee of the Committee on Mine Haulage Roads, Coal Division, American Mining Congress. The trend toward heavier mine equipment, large capacity cars, and high speed trips indicates a need for heavier track construction in mines, the committee believes. Standards for frogs and switches for 70 to 100-lb rail have been completed and approved by the Committee on Mine Haulage Roads, and further work is under way on 85, 90, and 100-lb turnouts. The subcommittee is made up of rail manufacturers and mine operators.

The *Mining Congress Journal* (Jan, 1954) reports:

"The first standards for frogs, switches, and turnouts for coal mine tracks were formulated by the American Mining Congress, Coal Division, Committee on Mine Haulage Roads and approved by the American Standards Association in 1934. These have been adopted by manufacturers of frogs, switches, and other track accessories so that today the parts of mine track turnouts have standard dimensions and are interchangeable. These standards cover only up to 80-lb rail, however."

This work was called to the attention of the Mining Standards Board at its meeting February 19 in connection with a possible revision of the existing American Standards — Frogs, Switches and Turnouts for Coal Mine Tracks (Drawings for Light Rail Turnouts), M7.1-1933 and Frogs, Switches and Turnouts for Coal Mine Tracks (Drawings for Heavy Rail Turnouts), M7.2-1935.

Letter Symbols, Y10 —

Sponsor: The American Society of Mechanical Engineers.

Rapid development of the aeronautical sciences has made it necessary to revise the 1950 edition of the American Standard Letter Symbols for Aeronautical Sciences, Z10.7-1950. A proposed revision has now been completed by the subcommittee in charge and has been sent to Sectional Committee Y10 for vote by letter ballot.

A Subcommittee on Letter Symbols for Rocket Propulsion, Y10-17, held its fourth meeting at the Aerojet-General Corporation, Azusa, California, April 21, 1954.

Working Groups are now completing lists of symbols on which they have agreed. These lists are to be consolidated into a general list which will be circulated to industry for comment.

A fifth meeting of the subcommittee is planned for the middle of June.

Chairman of the subcommittee is

Robertson Youngquist, Reaction Motors, Inc; secretary is J. P. Layton, Forrestal Research Center, Princeton University.

Members are scientists from ballistics laboratories, rocket manufacturers, designers, advisory committees in the field of aeronautics, and research centers, both civilian and military.

• • **New members** of ASA's Standards Council — Henry J. Hood, Eastman Kodak Co., representing the Society of Motion Picture and Television Engineers; A. D. Knowlton, Bell Telephone Labs, Inc., representing Telephone Group; F. A. Upper, Carborundum Co., representing Grinding Wheel Institute.

• • **International methods** for testing the overall performance of A.M. radios have been issued by the International Electrotechnical Commission from its central office in Geneva. The data may be used by manufacturers, testing organizations, college laboratories, and similar groups.

Publication 69 offers test procedures for all ordinary broadcast frequencies (150 kilocycles to 26.1 megacycles) and extends into the short wave band.

The proposed methods of testing are for such properties as sensitivity, interference, frequency response characteristics, distortion, stability and various miscellaneous properties, such as: radiation, tuning, and power and current consumption.

The booklet contains 47 drawings, including artificial test circuits, test circuit arrangements, and typical presentation of results.

The 91-page publication may be obtained for $3.00 from the American Standards Association, 70 East 45 Street, New York 17, N. Y.

• • **Gunnar Palmgren,** Vice-President of Engineering and Research, SKF Industries, Inc, Philadelphia, has been appointed to represent the American Standards Association on Working Group 4 of the international committee on Ball and Roller Bearings, ISO/TC 4.

The editor has recently received a presentation to top management on its part in the application of standards which seems to warrant reproduction here.

An Electrical Engineer Asks Management —

ARE YOU MAKING MONEY FROM STANDARDS?

To Company Management —

Gentlemen:

I am sure each of you is dedicated to the principle that the financial assets of your company must not be wasted. As property operators or as financiers of the electrical industry, whose growth continues to amaze even the most optimistic, you are aware that waste and error of judgment even in small segments of the business can in the aggregate result in very large financial loss. Yet we know that in many cases top management is unaware of millions upon millions of dollars now being poured down a rat hole. Are you interested in what rat hole? I am talking specifically about electrical apparatus bought to special requirements where standardized equipment would do the job admirably.

"But" you say, "I am not an engineer" or "I cannot concern myself with details" or "I leave that to my engineer." You are right in one sense but in a larger sense it is *your* viewpoint on the use of standards — "your policy" to be exact — which will determine whether your company is a friend or foe of standards.

This is not to say that a standard will always do the job or is always more economical than something built to special order. However, it is true in many more cases than you might think.

The annual purchase of electrical apparatus in the fields where excellent standards already exist now runs into billions of dollars a year. Each year increases this amount, because new standards are constantly being developed and because total electrical apparatus requirements are growing. For easy figuring, let us assume the annual purchases in this area are $10 billion dollars and that buying standardized equipment will save 10 percent on one-half of this equipment. These figures are not exaggerated. We are talking about a saving of $500 million dollars a year. If we cut this in half or in quarters, it still represents a huge sum of money.

Why is only a fraction of it being saved? Do we lack competent engineers to establish these standards? No, there seems to be an ample supply of engineers both from the users' and from the manufacturers' organizations. Do we lack the skill to apply standards? I am sure that we do not. What we lack is a sense of urgency in their use. What we lack is a *directive from management* to use standards wherever possible. What we lack is perhaps an intent interest on the part of executives in what they now often consider as "details."

The philosophy exemplified by the following statements has in many cases emanated from management.

"Look around — there's some one who will sell us our special requirements at the standard prices. Others will follow in line."

"Keep the pressure on — someone will give in and we will get our specials at the price others pay for standards."

"Our purchases are big enough to get what we want regardless of industry standards and not pay any premium either."

Gentlemen, these expressions can destroy almost overnight countless hours spent in standardization work. In the final analysis, the success of standards depends not on their creation alone, but on their support through usage.

Contrast these with the following two statements, the first made by a California utility executive, the second by a Southern utility executive.

"We can definitely say that our Company has already saved many thousands of dollars by the adoption of standard equipment."

"All transformers within the ratings covered by this standard are now being purchased to conform to this standard. Please advise us if any are received in your division which vary from it."

If you want to help plug up a multi-million dollar rat hole, you can do it by lending your authority and prestige to standards in the many places where today they could be, but are not being used.

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